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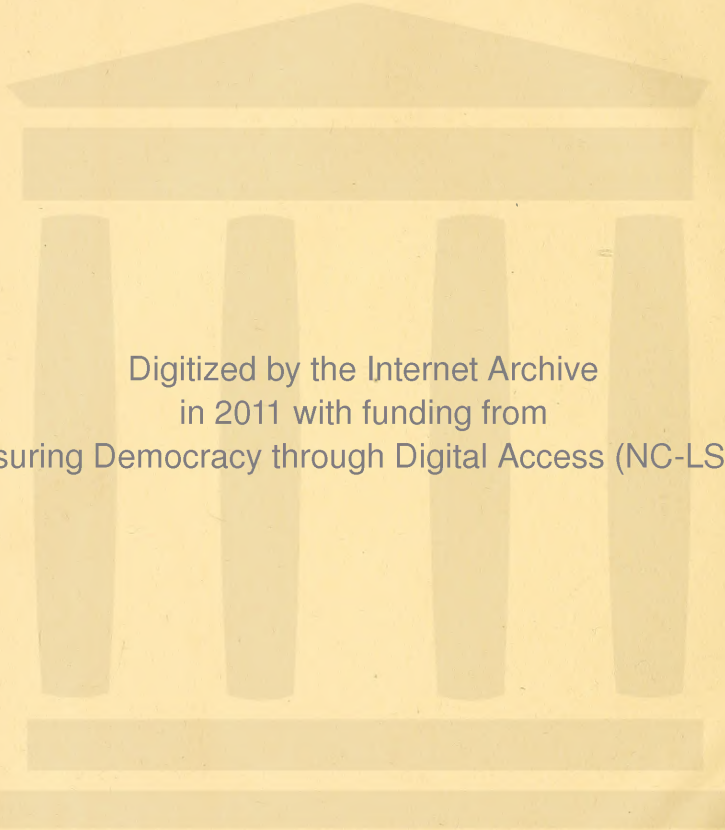


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**BIENNIAL REPORT**  
  
of the  
  
**North Carolina Department  
of Agriculture**

From July 1, 1930  
To June 30, 1932



RALEIGH  
EDWARDS & BROUGHTON COMPANY  
STATE PRINTERS  
1932



BIENNIAL REPORT  
of the  
North Carolina Department  
of Agriculture

## LETTER OF TRANSMITTAL

*To His Excellency, O. MAX GARDNER,  
Governor of North Carolina:*

SIR: In compliance with Chapter 248, Public Laws of 1929, I submit the following report of the work of the Department of Agriculture for the past biennium.

Respectfully,



*Wm. A. Graham*

*Commissioner of Agriculture.*

RALEIGH, N. C.,  
NOVEMBER 1, 1932.

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D. L. WRAY, JR.....	Junior Entomologist
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S. D. ALLEN .....	Supervising Seed Analyst
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H. T. DAVIS.....	Junior Curator

## DRAINAGE

F. O. BARTEL .....	Drainage Engineer
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## VETERINARY

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L. J. FAULHABER.....	Associate Veterinarian
W. R. BAYNES.....	Junior Veterinarian
R. B. STATON.....	Junior Veterinarian
T. T. BROWN.....	Junior Bacteriologist
H. S. WILFONG.....	Junior Bacteriologist
H. B. HARRIS.....	Senior Accounting Clerk Stenographer



## TEST FARMS

F. E. MILLER.....	Director and Horticulturist
R. E. CURRIN, JR.....	Superintendent Edgecombe Test Farm, Rocky Mount
J. W. HENDRICKS.....	Superintendent Iredell Test Farm, Statesville
S. C. CLAPP.....	Superintendent Buncombe Test Farm Swannanoa
CHAS. DEARING .....	Superintendent Pender Test Farm, Willard
E. G. MOSS.....	Superintendent Granville Test Farm, Oxford
J. L. REA, JR.....	Superintendent Washington Test Farm, Wenona
LOUISE WRIGHT.....	Junior Stenographer Clerk
ELIZABETH FLOYD.....	Junior Stenographer Clerk
B. D. WILLIAMS.....	Junior Stenographer Clerk
T. H. CAMERON.....	Experiment Station Dairyman
D. P. SOUTHERLAND.....	Experiment Station Foreman
H. B. COULTER.....	Experiment Station Dairyman
C. O. BOLLINGER.....	Experiment Station Poultryman
A. B. DEAN.....	Experiment Station Foreman
W. M. WHISENHUNT.....	Experiment Station Foreman
G. K. JONES.....	Experiment Station Poultryman
W. C. ALLSBROOK.....	Experiment Station Herdsman
A. P. LEFEVRES.....	Experiment Station Feeder

## DAIRY

A. H. KERR.....	Dairy Specialist
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## GASOLINE AND OIL DIVISION

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S. G. ALLEN.....	Principal General Clerk
T. A. FOWLER.....	Junior Chemist
J. B. JOYNER.....	Junior Chemist
C. R. WARLICK.....	Senior Accounting Clerk
MARY N. DUDLEY.....	Senior Accounting Clerk and Stenographer
PEARL KOONTZ.....	Senior Stenographer Clerk
T. J. BETTS.....	Inspector
W. C. FIELDS.....	Inspector
J. K. HARRISS.....	Inspector
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W. M. MILLER.....	Inspector
J. B. YARBOROUGH.....	Inspector

## WEIGHTS AND MEASURES

C. D. BAUCOM.....	Superintendent
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**BIENNIAL REPORT**  
**of the**  
**COMMISSIONER OF AGRICULTURE**  
**1930-1932**

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**FOREWORD**

We are just now in the midst of an era that is destined to go down in history as one of the greatest transition periods of all time. The readjustments that are under way will not be perfected over night. We need not expect to have our problems solved by magic. History, which extends as far into the distant past as human records go, moves slowly and often brings into play processes which have many angles. What the future has in store depends upon how we utilize present opportunities.

Agriculture is immensely involved in the present situation and its fate will depend more largely upon the sincerity of our leadership than any other one factor. Linked with this essential spirit of sincerity must be common sense and fair play. Business in general has been hard hit these past three or four years. Fortresses of industry have fallen before the attacks of circumstances over which we seemed to have little or no control. Enterprises with years of success behind them have thrown up the white flag of surrender through no fault of their own; and agriculture, the most essential of all basic necessities, finds itself riddled from the gunfire of greed, which was quick to seize upon the opportunity to exploit the farmer.

The measure of success with which agriculture survives will be dependent in no small degree upon the united effort which it exerts, as reconstruction programs continue to be formulated and put into effect. We are told in Holy Writ that "man cannot live on bread alone," and neither can agriculture live on mere promises. Had it been able to do so, it would today occupy an impregnable pinnacle of success in the ultimate meaning of that word. Could these promises be used to cancel mortgages, there would not be an incumbered farm home in



America. But, alas! promises can neither lift mortgages nor pay taxes.

But agriculture cannot fail in the final readjustment of things, because it is essential to life itself. When all else goes down in defeat, the farmer must carry on, somehow, for his is the mission of feeding and clothing the world.

I cannot fail to believe that the worst phase of this trying ordeal that has held us in its grip since 1929 has passed. Be that as it may, we have learned many lessons of fortitude and endurance and the lessons we have learned should certainly constitute a valuable asset in our future experiences. The irony of the whole situation, however, has been unparalleled, with grain, cotton and other commodities in abundance and people going hungry and cold. Whatever may be said in justification of those who have posed as national benefactors; whether we question their motives or not, there has been something radically wrong with a system that has allowed such things to be. Remedial measures have seemed slow in the results shown; the way has been hard and the hours of waiting have been long. How anyone, whether he be prince or peasant, professional man or laborer, can fail to be moved to great feeling in this matter is, it seems to me, beyond comprehension.

Here in North Carolina we have shared the universal privations that have marked agriculture for their own throughout the great farming belts of all sections of our country. We have seen our farmers hope in vain for deliverance; we have seen their homes go for the satisfaction of taxes and mortgages; we have heard their cry for help. Our people have shown signs of stamina; they have toiled on and have stripped themselves of fastidious pretenses. They have, in many instances, abandoned non-essentials altogether. Realizing the futility of dependence upon some of the staple crops which have all too often resulted in unprofitable, and even disastrous, surpluses, they have, by the thousands, turned their attention seriously toward making this a self-sustaining State. Farmers, their wives and children have united in this worthy effort, and, according to reports that have been received for the past two seasons, have utilized their farm resources as never before and have laid by supplies for winter use.

During this period of depression, when retrenchment has been universal, the Department of Agriculture has done all within its power to meet and grapple with the situation, through its various lines of endeavor. The work of the past biennium, as presented in this volume, is proof conclusive of this statement. The General Assembly of 1931

reorganized the State Board of Agriculture so as to reduce its membership from ten to five, at the same time providing that each member should represent some definite phase of agricultural work. These gentlemen have given serious study to the problems confronting us. Members whose terms expire during the 1933 sitting of the General Assembly are J. G. Staton, D. H. Bridgers and C. S. Young.

Seizures have been handled as follows: Feeds, 166; fertilizer, 18; cottonseed meal, 41; seed, 28; stock remedies and tonic, 2; making a total of 255.

Penalties prescribed by law have been assessed against manufacturers of fertilizer and fertilizer materials whose samples, numbering 156, showed a deficiency of five per cent or above.

In the face of decreased revenues, the various Divisions in the Department have continued to function with efficiency. While it has, of course, been necessary to curtail numerous activities, a sincere effort has been made to impair as little as possible the usefulness of the Department as a whole and to confine expenditures to necessities.

In this volume will be found a detailed report of each Division.

#### ANALYTICAL

Through its Analytical Division, the Department extends protection to our farmers against inferior grades of fertilizers, feeds and insecticides. This work is carried on through the examination of samples drawn from all parts of the State and brought to our laboratories in Raleigh, where each is carefully analyzed and the results of such analyses are published through the medium known as The Bulletin. Copies of this periodical are sent to manufacturers, dealers and others who may be affected, while the Division of Publications mails hundreds of individual copies out each year to those making special request for them. During the period covered in this report, it is pointed out, 6,091 official samples of fertilizers were analyzed. It may be stated in this connection that the question of chlorine in tobacco fertilizers has become so important that during the past biennium the Analytical Division has determined the percentage of chlorine in tobacco fertilizers offered for sale and this information is now being published. It has been found that this publicity has already had a wholesome effect. In the main, the work of this Division has proceeded smoothly.

#### TEST FARMS

The Test Farm Division has continued to function, though its activities have had to undergo considerable curtailment, due to reduced



revenues. The work of this Division, it will be noted, is set forth in detail in the biennial report of its chief, which is printed in full in the body of this volume. Through this Division, the Department coöperates with both the United States Department of Agriculture and the State College in conducting experiments, making various tests and passing the results along to the farmers of the State, in order that they may be benefited thereby. The Test Farms are all advantageously located in different sections of the State, from the mountains to the sea coast, in order that the farmers of all these sections may enjoy a proximity to them. That our farmers are interested is attested by the fact that, each year, thousands of them visit the various farms, especially during the field day season in the summer months. While reduced finances have brought retrenchments to our Test Farm program, the depression also has brought an increased number of requests for information and practical help. Farm superintendents have been called upon for frequent addresses and their response has been generous, as they have endeavored to help our farmers to the extent of their ability. Field day exercises during the summer of 1932 were attended by approximately 18,000 people.

In the Test Farm report, in full, will be found a detailed statement of all the various projects that have been worked out during the past decennium, together with the various data compiled as the result of work done.

#### ENTOMOLOGY

Through the Division of Entomology the Department inspects nurseries, enforces plant quarantine regulations, coöperates with farmers in the control and eradication of pests and aids the bulb industry in North Carolina. A full statement of the work done by this Division during the past two-year period shows that it has functioned to a very satisfactory degree. Its biennial report shows just what has been accomplished along the lines for which it is responsible, together with a summary of fees collected and other duties performed. Demands on this Division have continued and its services have been extended in every instance possible, in line with its usefulness to farmers and others who look to it for help. This Division has shown a fine spirit of cooperation with the Federal Department and with all other agencies with which it has been called upon to work.

#### FOOD AND OIL

The work of the Food and Oil Division, through which the Department aids in safeguarding the people against adulterated and other-



wise inferior food, cold drinks and oil, has proceeded satisfactorily during the past two-year period; and, while many problems have arisen, these have been approached from a commonsense, as well as legal, standpoint and the net results have been gratifying, as shown by the biennial report. Inspection fees have been collected to the total of \$38,113.34. Oil and gasoline taxes are collected under the Commissioner's office. The work of the Food and Oil Division is brought in from all sections of the State, as is the case in the Analytical Division, and it requires much vigilance on the part of inspectors the year round. It takes a great amount of both tact and perseverance to enforce the various rules and regulations for which the Food and Oil Division is responsible.

All details concerning the operations of this Division for the past biennial period are set forth in the body of this report.

### MARKETS

Work of the Division of Markets during the past two years has thrown the Department face to face with many intricate problems that have been faced by our farmers, and every effort has been exerted to give them help in every possible way. Curtailed funds have also made numerous retrenchments necessary in this Division, at a time when farmers most needed its help and advice; but, taking all factors into consideration, it is felt that much has been accomplished and the groundwork laid for even greater service in the future, with the return of normal conditions, when the judicious marketing of crops will be more important than ever before. This Division has continued to function in the interest of those needing its services and has continued to encourage and organize mutual exchanges and aid in the inspection and marketing of fruits, vegetables and other agricultural commodities. The showing it has made with conditions as they were has been very gratifying, as will be seen from details hereinafter set forth in the full biennial report of the Division. Numerous facts are set forth, including a proper classification of the various undertakings of the Division and how it has helped to standardize as well as market the farmers' crops for them. It has worked in coöperation with the Bureau of Agricultural Economics and with all other agencies with which it has come into contact for the improvement of marketing conditions.

## VETERINARY

That portion of the Department's work conducted through its Veterinary Division has been extremely gratifying during the past few years, and the past biennium has shown many accomplishments. Work has proceeded in the interest of tick eradication in reinfested territory. Since the completion of the work of testing all cattle in all counties in the interest of bovine tuberculosis eradication, herds in State institutions have been tested, as well as imported herds. Numerous requests are constantly received for various forms of service which the Department renders the farmers through this Division, and as nearly as humanly possible all assistance which could be rendered in conformity with law has been given. The biennial report of this Division sets forth in full all the details of what has been done during the past two years. The report, as submitted to me, covers many typewritten pages and all the information is given in this volume.

## DAIRYING

The Dairy Division has continued to function without interruption during the past biennium, which is covered in full in the report of the chief appearing in this volume. This Division was created and is maintained for the benefit of the dairy farmers of North Carolina. Numerous tests, in conformity with the general purposes of this Division, have been made during the past two years and much territory has been covered by the chief in the discharge of his official duties, who has attended numerous meetings and formed many contacts. Total inspections reported by him for the period of this report number 9,325, including those made in connection with the proper enforcement of the oleo-margarine law, while in addition to this total 5,575 tests have been made on the basis of butter fat valuation as determined by the Babcock test, and 682 tests to check those made by plants to determine errors, whether due to mistakes or with the intention of evading the law.

## WAREHOUSES

Activities in the Warehouse Division during the biennium were marked. Among other things, it is pointed out that during 1932 the number of warehouses licensed increased to 73, with a total capacity increased to 375,000 bales; 290,000 bales were handled, or over 40 per cent of the year's crop. Complete details of the work of this important Division appear in this volume, as submitted to me by the chief.



## MUSEUM

The North Carolina State Museum, a Division of the Department of Agriculture, is one of the oldest and best to be found anywhere in the United States and enjoys an enviable reputation both at home and abroad, being visited annually by something like 200,000 people. While reduced funds have curtailed expansion to a great degree during the past two-year period, yet this institution is a permanent asset and its present equipment constitutes a solid foundation for the future. I have and am presenting this volume a complete story of the Museum's progress during the biennium under discussion. It may be stated in this connection that accessions are always gladly received when donated to the Museum, which for many years has been a valuable educational asset. Its doors are open every day in the year, with the exception of Sundays and Christmas Day, regardless of what other holidays may be enjoyed by other State agencies.

## WEIGHTS AND MEASURES

While the Weights and Measures Division has always labored under a handicap, due to lack of sufficient revenue at any time, yet the report of this Division for the past biennial period shows much activity. The chief reports a total of 42,457 inspections, 6,499 condemnations, 854 condemnations, 912 releases and 31 prosecutions. The activities of the Division have been remarkable taking into consideration the limited funds and, consequently, the limited personnel.

## SAVINGS AND LOAN

The Division of Savings and Loan Associations reports progress. Financial conditions of the past two years have made this work of more than usual importance, when credit was a vital factor. The chief of this Division reports numerous calls for service and enumerates all the activities coming under her supervision in her biennial report, which is printed in full elsewhere. There are now 61 active organizations in 35 counties, with resources of approximately \$475,000 and a combined membership of nearly 4,000.

## BOTANY

Through our Division of Botany a direct service is extended to hundreds of farmers each year. Broadly speaking the duties of this Division include: Examination and testing, for purity and germination, of field, garden, flower, tree and herb seed; the identification, study and



control of noxious weeds; the manufacture and distribution of pure nitro cultures for the inoculation of the seeds of different legume crops; the placing of commercial grades on grains, and recleaning and treating tobacco seeds.

The report of this Division, covering all its various activities for the past biennium, appears further on in this volume and gives details as to just how it functions for the direct benefit of our farmers.

#### PUBLICATIONS

Through the Division of Publications, in charge of the agricultural editor, the Department maintains contact with the public, through the press, over the radio and by means of correspondence with those desiring information on various subjects. This Division has arranged 104 weekly broadcasts during the past biennium, and the editor has prepared and edited copy for 52 issues of the semi-monthly publication known as *Agricultural Review*, which is read by approximately 30,000 farmers and others who receive it the 15th and 25th of each month. The editor of publications also handles all the publicity for the State Fair each year without added compensation, voluntarily, as a part of his official duties. His report is given in full elsewhere in this biennial report. All information released by the Department is handled by him.

#### STATISTICAL

In coöperation with the Federal Crop Reporting service, the State Department of Agriculture maintains a Statistical Division, which gathers information on crops and various other data for the benefit of our farmers. Through this Division a farm census is made annually, which is rated as one of the best taken anywhere in the United States. The information gathered by this Division is available to anyone applying for it at any time. Monthly tobacco sales statistics also are made up in this Division and released through the Division of publications, also monthly crop reports and other material of a statistical nature. This Division has continued to function during the past biennium and has rendered valuable service. Its crop figures are sent to inquirers in all sections of this State and in other States as well.

## ANALYTICAL DIVISION

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*To the Commissioner of Agriculture:*

SIR: I beg to transmit herewith the biennial report of the Analytical Division.

In compliance with provisions of control laws covering the sale of fertilizers, feeds and insecticides, this Division has been occupied during the past two years, as heretofore, in making analyses of samples of these materials. Most of these were drawn by Department inspectors, though as usual, quite a number were sent in by individuals. In addition many other products bearing upon the agricultural development of the State have been tested for purchasers and consumers.

Samples collected from all parts of the State have been analyzed, results mailed to the interested parties and published in the Bulletin of the Department, where they were shown in comparison with their guarantees as branded on the bags or other containers in which sold. In cases where the analysis has shown a deficiency in essential ingredients to such an extent as to come within the penalty class, the results have been reported to the Commissioner of Agriculture, who has enforced the penalty for the benefit of the consumer.

During the period covered by this report 6,091 official samples of fertilizers were analyzed, and out of this number only 166, or 2.73 per cent fell as much as 5 per cent below their guaranteed value in plant food and thus became liable to penalty. It might also be of interest to note that the number of fertilizers which showed an overrun on analysis greatly exceeded those in which there was a deficiency.

The question of chlorine in tobacco fertilizers has become of so much interest and importance to the growers of tobacco that this Division determined during the seasons of 1931 and 1932 the percentage of chlorine in all samples representing fertilizers which were recommended especially for tobacco. A small quantity of chlorine in tobacco fertilizers is considered beneficial, whereas above 2 per cent is looked upon as dangerous.

Chlorine is introduced into fertilizers in combination with potash, or associated with certain sources of potash. It is therefore necessary that the manufacturers exercise strict chemical control over all raw materials carrying potash which are intended for use in tobacco fertilizers. This condition, until recently, did not seem to be fully



understood by all manufacturers, with the result that quite a number of samples showed an excessive amount of chlorine.

With the publicity that has been given the question of the possible harmful effect of chlorine when present in an amount exceeding 2 per cent, and with a fuller realization on the part of the manufacturers of the necessity of keeping it within limits, a very great improvement was shown by the 1932 samples over those drawn in 1931.

This can be observed from the following summary:

	1931	1932
Number samples in which chlorine was determined.....	934	635
Number samples containing 2 per cent or less.....	345	402
Number samples containing between 2 per cent and 3 per cent....	305	150
Number samples containing over 3 per cent.....	284	83

There have been no developments of particular importance in feed control work during the past two years. A few cases of adulteration were discovered, but proper action was taken by the Department, and they were quickly corrected.

Due perhaps to the low prices for feed-stuffs that have prevailed, the number of new products coming into use has been smaller than has heretofore been the case.

During the past year the feed control work suffered a severe loss in the death of Mr. R. C. Lineback, who had been Feed Inspector for many years.

In the main, the work has proceeded smoothly and the samples examined have complied substantially with the guarantees.

There have been no developments of special interest in the insecticide work. All samples, both those drawn by inspectors and those sent in by consumers, have been analyzed promptly and reported upon. There has been a decrease in the number of samples sent in by consumers, probably due to the fact that the supply of old material scattered in small lots throughout the State has become exhausted.

A number of samples of this type of material have hertofore been received for identification and analysis.

We have had no complaint of inferior goods, and the samples analyzed have shown excellent compliance with their guarantees.

The amount and kind of chemical work performed in the laboratory during the past two years is shown in the following summary:



Official Fertilizers .....	6,091
Fertilizers and Fertilizer Material for Farmers.....	203
Official Feeds .....	755
Miscellaneous Feeds .....	240
Insecticides .....	105
Cotton Seed Meals.....	397
Limes and Marls.....	56
Miscellaneous .....	79
Total .....	<hr/> 7,926

Most of the analyses listed above necessitated a number of different determinations. It may be of interest to note that the total number of quantitative determinations required was in excess of fifty thousand.

Respectfully submitted,

W. G. HAYWOOD,  
*Chief, Analytical Division.*

## TEST FARMS DIVISION

*To the Commissioner of Agriculture:*

SIR: I take pleasure in submitting this Biennial Report of the activities of the Division of Test Farms. It is the purpose of this report to present the program of work at each of our six Test Farms with brief statements as to results secured.

### COÖPERATION

The Test Farms have endeavored to coöperate with all agencies interested in the development of agriculture in North Carolina. The present experimental program consisting of 143 definite projects is handled in coöperation with the Agricultural Experiment Station at the North Carolina State College of Agriculture and Engineering, and in some instances with the United States Department of Agriculture. Close coöperation has also been maintained with such agencies as the Agricultural Extension Service, Vocational Agricultural Service and various commercial and civic organizations.

### PUBLIC RELATIONS

The general depression and business conditions especially in agriculture, has brought to the Test Farms more requests for information, during this biennium than in any other previous period. The correspondence with farmers and others interested in agricultural work has been greater than at any other period. The Superintendents have also been called upon more often to make public addresses on such agricultural subjects as the Live-at-Home program, pasture and livestock development and the improved methods of growing different crops.

One other important feature of the Station's activities is receiving visitors and giving them the information desired, which usually includes a tour over the Station farm. Our six Stations are considered centers for agricultural information in their respective sections, and there is not a day passes without visitors seeking information or service of some type. It is estimated that 50,000 people visited the Test Farms during the past year.

The Stations have continued to hold the Annual Field Days. These meetings have become fixed institutions in the agricultural life of the state, and are one of the best means of giving the public the benefit of the work of the Station Farms. The meetings this past summer were attended by approximately 18,000 people.



## REDUCED PROGRAM

This biennial period has been the most difficult in the life of our Test Farm Organization. Market conditions, incident to the depression, have increased the difficulty of profitable disposal of surplus crops and commodities resulting from the Stations activities. In addition the curtailment of financial support through the Budget Bureau rulings has necessitated a cut in our experimental program of 40 per cent; reduction of labor payrolls as much as 50 per cent, and discarding the program of maintenance and improvements to our Station property. The Test Farms appropriation for the current fiscal year is more than 50 per cent less than the appropriation for the year ending June 30, 1930.

While the general conditions have been discouraging, nevertheless it has been found possible to render much service to the farming interests of the State during their own period of trial and to make progress on certain projects. The program of work with progress reports will be given in the following reports of the six Test Farms.

## PIEDMONT STATION—STATESVILLE

J. W. HENDRICKS, *Assistant Director in Charge*

Station established in 1903

Area of Station, 207 Acres      Soil Type, Cecil Clay Loam

*Climatological Data for 1931*

Elevation of Station Farm, 975 feet above sea level.

Mean Annual Temperature, 60.7 degrees Fahrenheit.

Annual rainfall, 41.59 inches.

Total snowfall, 16.2 inches.

The following will give the program of work and a brief progress report on the chief experiments underway.

## LIVESTOCK

*In Coöperation with N. C. Experiment Station*

1. *Comparing the Value of Corn, Wheat and Barley in feeding Beef Cattle.* This experiment included twenty-seven head of plain two-year-old steers of grade Shorthorn, Hereford and Devon breeding. The feeding period ran from November 7, 1931, to February 23, 1932. The cattle were divided into three equal and uniform groups as possible, as to size, conformation, condition and breeding.



Lots	Ration fed for 108 days	Cost per 100 lbs. gain
No. I.	Ground corn, cotton seed meal, corn stover.....	\$7.12
No. II.	Ground wheat, cotton seed meal, corn stover.....	8.61
No. III.	Ground barley, cotton seed meal, corn stover.....	9.08

The cost cwt. gain was \$1.49 less for Lot No. I than Lot No. II, and \$1.96 less than for Lot No. III, giving Lot No. II an advantage of 47c over Lot No. III. In a like way the necessary selling price per cwt. to break even was 26c less for Lot No. I than Lot No. II and 43c less than for Lot No. III, giving Lot No. II an advantage of 17c over Lot No. III. The steers in Lot No. I also showed a little more finish than in the other two groups.

2. *Drenching Lambs for Stomach Worms.* The drenching of sheep with nicotine sulphate solution has proved to be a satisfactory practice in the control of stomach worms.

3. *Wintering the Farm Flock of Sheep.* The purpose of this project is to collect data on the cost of carrying a farm flock through the winter in a most economical and practical manner in keeping with general farm conditions, utilizing the stalks and stubble field gleanings, cover crops, etc.

4. *Cost of Raising Pigs.* The results of this work is published in Experiment Station bulletin No. 272. The Station also furnishes Pure-bred Poland China breeding stock to farmers at a reasonable price.

#### AGRONOMY

##### *In Coöperation with N. C. Experiment Station*

5. *Fertilizer Lime Rotation Experiment.* The four year rotation used in the experiment is as follows:

1st year—Cotton, rye (cover crop).

2nd year—Corn, wheat (in fall).

3rd year—Wheat, Red Clover.

4th year—Red Clover.

One-half of all plants are limed broadcast with one ton of ground limestone applied every fourth year. Where only one plant nutrient was applied, phosphoric acid gave the highest yield, with nitrogen second in importance. Potash is least required of the three main plant food elements. On the lime portions, applications of phosphoric acid alone gave greater yields of red clover hay than did applications of either nitrogen or potash alone.

6. *Value of Different Carriers of Phosphoric Acid.* The results show that superphosphate is a more efficient carrier of phosphoric acid than rock phosphate when used in equivalent amounts under corn. This experiment was closed after harvesting the corn crop in the fall of 1931.

7. *Cotton Improvement.* The Mexican Big Boll variety is grown exclusively at this Station. Pure line selection work is carried on each year, and high yielding strains of uniform staple have been developed which are well adapted to the conditions under which they are grown. Last spring this Station distributed to growers, three hundred bushels of registered Mexican Big Boll cotton seed, Strain 58-14.

8. *Corn Selection.* The Weekley's Improved variety of corn is grown here. Each year selected seed corn is distributed to farmers at a reasonable price.

9. *Wheat Variety Tests.* The average results for an eight year period is as follows:

<i>Variety</i>	<i>Average Yield Bushel per Acre</i>
Fulcaster .....	29.2
Gleason .....	28.4
Purple Straw .....	27.2
Leap's Prolific .....	27.0

10. *Oat Varieties.* The Lee variety has proven so far the best winter oat for fall seeding in the Piedmont area of the State. It is more resistant to winter injury. The Fulghum variety has been the best yielder when it is able to survive the winter, but it is subject to winter killing.

11. *Small Grain Seed Improvement Studies.* Pure line seed selections are made each year from the following grain varieties and the pedigreed seed are distributed to farmers at a reasonable price.

- a. Leap's Prolific Wheat.
- b. Abruzzi rye.
- c. Lee Oats.
- d. Beardless Barley, Tennessee 6.

As a result of this work, farmers of the Piedmont area look to this Station as a source of pure-bred small grain seed.

12. *Rust Resistance Studies with Small Grain.* The object of this test is to develop strains which are rust resistant, and some progress has been made.



13. *Cotton Variety Tests.* Improved varieties producing a staple length of 1 to 1 1/16 inches have given the largest money returns per acre. The highest yielding varieties producing this staple are the Mexican strains, Cleveland Nos. 884-5 and 20-3.

14. *Pasture Fertilizer Tests.* Results of this test indicate that nitrogen is the most needed plant food element for increasing the carrying capacity of pastures.

#### FORAGE CROP EXPERIMENTS

The following will give a report on projects handled in coöperation with the U. S. Department of Agriculture, with Mr. R. E. Stitt, Assistant Agronomist representing the Federal Department.

15. *Alfalfa Strain Tests.* The results show that Dakota, Utah and Kansas are good domestic seed sources. France, Italy and some parts of South Africa are also apparently good seed sources for North Carolina. The average yields of alfalfa are about two tons per acre of oven dry hay..

16. *Red Clover Strain Tests.* American Red Clover seed used in this strain test in 1929-1930 out yielded all foreign sources used in the test. Spring seedings out yielded fall seedings when Tennessee and French seed were used.

17. *Soybean Variety Test.* The Giant Soybean, Easy Cook, No. 17, Johnson, Laredo, Haberlandt and Herman soybean varieties are good yielders in this test. Giant Soy, Easy Cook No. 17 and Johnson are late maturing, coarse varieties. Laredo is a late maturing variety with fine stems and makes a good grade of hay. Herman is a medium early maturing variety that produces a high yield of good quality hay.

18. *Acid Tolerant Legume Nursery.* A total of 152 strains of 102 species of leguminous plants were seeded in this nursery and observations have been made on their growth habits. Many of these plants made excellent growth and further studies will be made as to their possible use in the agriculture of the Piedmont Region.

19. *The Control of Dodder in Lespedeza.* A number of methods of dodder control were studied with the conclusion that in so far as the methods studied were concerned effective control is expensive. Burning the infested areas with a blow torch proved to be the most economical of the effective methods tested.

20. *Time of Cutting Annual Lespedeza for Hay.* When cut for hay alone, Korean Lespedeza gave the highest yields when harvested



September 10. Common yielded the most hay on October 22, and Kobe on September 24. Kobe yielded 3,164 pounds per acre, and Korean 2,376 pounds of oven dry hay. Korean, Common and Kobe varieties gave the best yield of seed when harvested on October 22 and Tennessee No. 76 on November 4. Korean yielded 522 pounds of seed per acre, Kobe 356 pounds, Common 234 pounds and Tennessee No. 76, 110 pounds.

21. *Lime and Fertilizer Trials with Annual Lespedeza.* So far the results show that Kobe and Korean lespedeza do not respond to lime or fertilizer treatment.

22. *The Effect of Nitrate on Lespedeza after Grain.* Korean lespedeza did not respond to top-dressing with sodium nitrate, after the nurse crop had been harvested.

23. *Date of Seeding Annual Lespedeza.* Plats of Korean and Common lespedeza seeded at intervals of two weeks beginning February 15 were about equal in stand and growth up to and including April 14. There were plants on Plats seeded on April 27 and May 11.

24. *Rates of Seeding Annual Lespedezas.* Korean and Common Lespedezas gave the highest yields of hay where seeded at the rate of five million seed per acre.

25. *Inoculation of Korean Lespedeza.* Korean lespedeza made equal nodule developments on inoculated and uninoculated plats.

## HORTICULTURE

### *In Coöperation with N. C. Experiment Station*

26. *Peach Pruning Experiment.* This test is in its eighth season, and the light pruning continues to give largest yields of fruit of good color and size at the least pruning cost.

27. *Peach Fertilizer Tests.* The results of this experiment indicate that nitrogen is the only element necessary to maintain growth and production of peach trees grown on this soil type.

28. *Fruit Variety Studies.* The purpose of this test is to determine fruit varieties best suited to Piedmont conditions. The test includes peaches, cherries, grapes, apples and the small fruits.

The work of this Station is becoming more appreciated each year by the farmers of Piedmont North Carolina. This is evidenced by the increasing number of visitors to the Station seeking information or service of some type. It is estimated that we have an average of 400

visitors each month. The Annual Field Day has been quite successful and helpful in giving the farmers the benefit of our Station program of work.

### MOUNTAIN STATION—SWANNANOA

Located on State Highway No. 10, eleven miles east of Asheville

S. C. CLAPP, *Assistant Director in Charge*

Station established in 1908

Area of Station Farm, 305 Acres      Soil Types, Toxoway and Ashe Clay Loam

#### *Climatological Data for 1931*

Elevation of Station Farm, 51 feet above sea level.

Mean Annual Temperature, 55.3 degrees Fahrenheit.

Annual Rainfall, 46.75 inches.

Total Snowfall, 21 inches.

This Mountain section of the State embraces the large plateau area extending from the Tennessee line eastward, and includes the eighteen western counties known as the Blue Ridge Mountains of North Carolina.

This section has great agricultural possibilities, principally with fruit, truck crops, dairying, poultry, small grain, pasture and beef cattle. With the increasing population as a health section, and the development of the Great Smoky Mountain National Park, the demands are likewise increasing for information in agriculture. The following program of work is carried on with the view of meeting these demands.

### DAIRYING

#### *Coöperating with the N. C. Experiment Station*

1. *Dairy Herd Development.* This project is a breeding and management study for increasing the production of butter-fat by using sires with pedigrees indicating high production.

In 1930 the average for the herd of eighteen cows was 341 pounds of butter-fat. In 1931 this average for the herd of 24 cows was 393 pounds of butter fat.

The following gives the official records of individual cows.

Sybil's Eminent Sula, Age 2 years, 1 month, Silver Medal cow, 8,980 lbs. milk and 529.7 lbs. butter fat in 305 days.

Sybil's May Olivia, Age 2 years. A Silver Medal cow, 9,907 lbs. milk and 554.53 lbs. butter-fat in 365 days.

Sybil's Eminent Yvonne, Age 2 years, Register of Merrit cow, 7,001 lbs. milk, 360.09 lbs. butter fat in 305 days.

Sybil's Lass Beauty, Age 3 years, 3 months. A Register of Merrit cow, 6,275 lbs. of milk, and 351.19 lbs. of butter fat in 305 days.



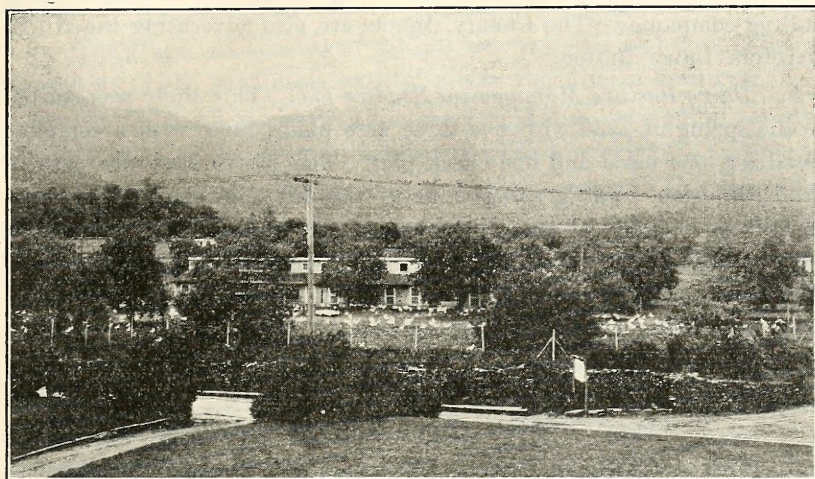


Fig. 1. COMMERCIAL LAYING HOUSE AT THE POULTRY PLANT, MOUNTAIN STATION



Oakwood Golden Belle, Age 2 years. A Silver Medal cow, 7,853 lbs. milk, 458.40 lbs. butter fat in 305 days.

Fern's Jubilant Lass, Age 2 years, 3 months. A Silver Medal cow, 10,035 lbs. milk, and 478.11 lbs. butter fat in 305 days.

Fern's Beautiful Arnette, Age 2 years, 1 month. A Register of Merrit cow, 8,494 lbs. milk and 460.79 lbs. butter fat in 365 days.

Pender's Distinguished Lass D., Age 3 years, 6 months. A Register of Merrit cow, 8,178 lbs. milk and 470.93 lbs. butter-fat in 305 days.

2. *Dairy Feeding Studies.* The North Carolina Dairy Ration, re-sulted from this test, and it is now being mixed and sold by leading milling companies. The County Agents are also advocating the North Carolina Dairy Ration.

3. *Dairy Pasture Management Studies III.* This study was started in the spring of 1930 with five three acre plats; three with a complete fertilizer, one basic and one check plat. The sod in each plat was in good condition. The grazing value of the different plats is measured in milk and butter fat using pure bred Jersey cows. The results show that it pays well to fertilize pastures. Where a complete fertilizer was used the increase over the no fertilizer plat was as much as 200 pounds of butter fat for the grazing period.

## POULTRY

### *Coöperating with N. C. Experiment Station*

4. *Cost of Producing Eggs.* This experiment is closed and the data has been published in Experiment Station Bulletin No. 254 on "Cost of Producing Eggs with S. C. White Leghorns and the Control of Roup and its Effect upon Egg Production."

5. *Poultry Feed and Breeding Experiments.* This work has been continued along as in previous years, but due to our much reduced budget it has been necessary to reduce the number of birds on the test. During 1930-1931, the high producing hens ran from two hundred to two hundred and sixty-two eggs per hen per year. The North Carolina Poultry Ration is being used in the feeding tests with good results.

## SWINE

6. *The Family Sow.* The Berkshire bred of hogs is used here and records are kept on the project, covering cost of maintenance and returns.

## HORTICULTURE

*Coöperating with N. C. Experiment Station**Fruit Varieties*

7. Of the thirty-eight varieties of apples tested the Delicious, Winesap, Stayman and Rome Beauty are outstanding for this section from the standpoint of production, quality and market value.

8. The raspberry test of eight varieties shows the Latham to be the best suited to this section, when considering hardiness, yield and quality.

9. The grape test consists of seventy-two varieties and data is being secured as to the hardiness, quality, yields and disease resistance.

10. In the dewberry variety test the Lucretia is the leading variety, although some of the other varieties are quite promising.

11. The strawberry variety test of eighteen varieties has been discontinued owing to lack of funds. From the information available, the Premier and Warfield are the leading varieties of this region.

12. The cherry variety test shows that the Montmorency and Early Richmond are well suited to this mountain country.

13. *Apple Pruning and Training.* This experiment was started in 1919 in order to determine the effect of the amount of annual pruning on earliness of bearing and productivity.

Average Yield in Bushels per Tree in 1931:

<i>Variety</i>	<i>Light Pruning</i>	<i>Medium Pruning</i>	<i>Heavy Pruning</i>
5.65 bu. per tree	5.52 bu. per tree	Staymen	7.06 bu. per tree
10.09 bu. per tree	5.52 bu. per tree	Winesap	11.28 bu. per tree
2.30 bu. per tree	1.36 bu. per tree	Delicious	2.65 bu. per tree
6.21 bu. per tree	2.65 bu. per tree	Rome Beauty	4.30 bu. per tree

The light pruning contrary to old methods used is giving the best results. The above information indicates that different varieties may require a varying amount of pruning.

14. *Apple Fertilizer Test.* Owing to the lack of funds this work was closed before we could secure dependable information.

15. *Apple Storage.* This work is conducted in the Station's storage house which was constructed in 1926. The results show the importance of careful attention during the storage period in order to maintain proper temperatures and humidity.

16. *Irish Potato Breeding.* Several thousand Irish potato seedlings were planted on the Station in 1931. This work was moved to



another location this past spring, but certain features of the project will be brought back to the Mountain Station next Spring. The object of the study is to develop a variety superior to our common varieties in regard to yield and disease resistance.

#### AGRONOMY

##### *Coöperating with N. C. Experiment Station*

17. *Soil Fertility Tests.* The results of the soil fertility tests at this Station have shown that phosphoric acid is first and nitrogen the second limiting factor in the production of corn, wheat and Irish potatoes. Omission of the potash has had least effect in decreasing yields. Lime is valuable, especially where legumes are used in the crop rotation.

18. *Sources of Phosphoric Acid.* When used in equal amounts in a complete fertilizer under wheat, superphosphate and Duplex basic slag proved of equal value. Rock phosphate was second, and soft phosphate the poorest source. (Closed 1932.)

19. *Wheat Varieties.* The Fulcaster gave the largest yields of the varieties tested, the average yield for a ten year period being 27.1 bushels per acre.

20. *Date of Seeding Wheat.* In this test plantings of wheat have been made every fifteen days from September 15 to November 15. The results show that October 10-15 is the best time for seeding wheat in this section.

21. *Oat Varieties.* Of the varieties tested the Fulghum has given the largest yield. The spring plantings have given better results than fall plantings owing to the effects of winter killing.

22. *Rye.* In comparing the value of Common and Rosen rye for this section, the tests so far show a slight difference in yield in favor of Rosen.

23. *Corn Selection.* Some valuable data has been secured on the importance of field versus bin selection of Biggs Improved seed corn. The field selections of seed corn resulted in much larger yields of corn and a larger number of two ear stalks.

24. *Soybean Varieties.* Of the many varieties tested at the farm, the Herman, Southern Prolific and George Washington were the best seed producers. The best hay varieties were found to be Laredo, Herman and Virginia.

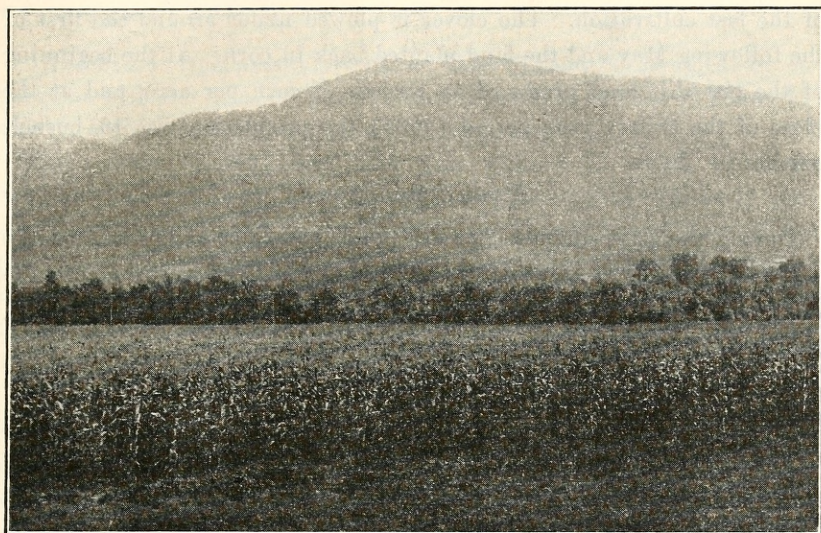


Fig. 2. TWENTY YEARS TEST, CRIMSON CLOVER AND CORN, ENDING 1931  
MOUNTAIN STATION



25. *The Vegetable Garden.* A year around vegetable garden is maintained to secure information on varieties best suited to this section, cultural practices and insect control. The receipts from vegetables are a big factor in the Station's budget.

26. *Continuous Corn and Crimson Clover.* This has been the outstanding cropping test of our program. A ten acre field has been planted annually to corn and crimson clover for the twenty year period ending in 1931. The crimson clover is sown in the corn at the time of the last cultivation. The clover is plowed under around the first of the following May and the land planted back in corn. At the beginning of the test this land produced 18 bushels of corn per acre, and at the close of the twenty year period (1931) the production was 46. bushels per acre.

#### PUBLIC RELATIONS

During the past summer 800 4-H Club boys and girls attended the 4-H Camp which is located on this property. Each group coming to the Camp, under the leadership of their County and Home Agents, would spend considerable time studying our program of work. They were required to take notes on the work to be used in their school room studies.

The number of visitors coming to the Station seems to be increasing each year. Since last spring we have had on an average of 500 visitors each month, seeking information on crops and livestock and to look over the work. The Annual Field Day held on the third Thursday of August has been very successful and is well supported by the farmers and civic interests of this region. The attendance at the last meeting was approximately 1,500 people and the rain undoubtedly kept many from attending.

#### \* GENERAL

It has been necessary to retrench in practically every phase of our program owing to the much reduced budget. It is especially regrettable that it has been necessary to discontinue a number of important experimental projects.

## TOBACCO STATION—OXFORD

E. G. Moss, *Assistant Director in Charge and Senior Agronomist U. S. D. A.*

Station established in 1912

Area of Station Farm, 250 Acres      Soil type, Durham Sandy Loam

*Climatological Data for 1931*

Elevation of Station Farm 2300 feet above sea level.

Mean Annual Temperature, 59.6 degrees Fahrenheit.

Annual Rainfall, 40.44 inches.

Total Snowfall, 4.5 inches.

All tobacco experimental work at this Station is handled in cooperation with the office of Tobacco Investigations, Bureau of Plant Industry, United States Department of Agriculture.

The seasons of 1931 and 1932 were difficult in which to obtain experimental data with tobacco. The drought during the early part of 1931 season followed by heavy rains in August caused most of the tobacco in the experimental plats to take second growth which resulted in very poor quality of the cured leaf. In 1932 the seasons were fairly favorable until about the middle of June, after which there was practically no rain until after the tobacco was harvested.

1. *Blue Mold Control.* During the 1931 season there was a mild outbreak of downy mildew (Blue Mold) in the tobacco seed beds which caused some injury to the seedlings. In the early spring of 1932 a very serious outbreak of downy mildew occurred and did considerable damage to the tobacco plants not only on the Station, but practically covered the flue-cured area. In trying to check the spread of this mold, a number of different spray solutions were used. The one used most generally was bordeaux mixture in different strengths. While the bordeaux mixture of a 2-3-50 and a 3-4-50 seem to check the spread of the mold, it also appeared to, retard the growth of the plants. Work is being continued along this line hoping to find some remedy in the near future.

The cold spell which occurred on March 10 and 15, 1932, with the temperature going down to 14 and 16 degrees F. respectively, killed a good many of the early tobacco plants. Later the young plants were attacked by the heaviest infestation of flea beetle that has occurred in several years. This with the blue mold caused a considerable reduction in acreage.

2. *New Nitrogen Test for Tobacco.* A number of sources of nitrogen have been tested out during the past two years among which Urea gave the best results of the synthetic group. Sterilized ground



tobacco stems were used in some plats for the purpose of supplying a part of the nitrogen and potash. This material seem to be very satisfactory when used at the rate of around 200 pounds per acre as a supplement for a part of the potash and nitrogen.

3. *Fractional Application of Fertilizer.* The series of plats which were begun in 1931 to determine the effect of fractional applications of fertilizer on the quality and yield of tobacco gave evidence that a split application of the regular fertilizer mixture, namely 600 pounds put in the drill at the time of planting and 400 pounds of the same mixture applied as a top dressing around the plants about the time of the first cultivation of the tobacco, was better than the dividing of the nitrogen or the nitrogen and potash. This, however, is the result of only one year's test and is not conclusive.

4. *Black Shank Control.* Out of 107 varieties and selections of tobacco planted in Forsyth County in black shank work, four varieties showed enough resistance to be encouraging during 1931. Two of these varieties, however, were hybrids of the fire-cured district, viz., Greenwood crossed on Dark Greenwood and York. The York which is a flue-cured variety showed approximately 30 per cent resistance, while most of the other varieties were killed out right, or the resistance so low that only a plant here and there lived. Seed were saved from these individual plants and have been used again in the same field in 1932. So far this season there are five selections of cigar tobacco, which are almost 100 per cent resistant. This tobacco has been crossed on flue-cured selections, and will be grown during the 1933 season.

5. *Black Root Rot Control for Tobacco.* Progress has also been made in obtaining plants resistant to black root rot (*Thielavia*). Selections of Paris Wrapper and Jamaica, (one of the selections of Cash), both of which are good flue-cured varieties, were quite resistant to this root disease. In a few instances Jamaica has been recommended for planting this year in preference to other flue-cured varieties because of its resistance to this disease. Plants for the 1932 season were planted from these selections and have continued to show resistance. It is believed that by another year or two these varieties may be recommended quite generally for areas where black root-rot is prevalent.

6. *Special Potash Tests.* The nutritional experiments have been carried on as usual with the result that a liberal application of potash has been found advantageous. In most cases around 50 to 60 pounds of  $K_2O$  per acre have been most generally recommended, although as

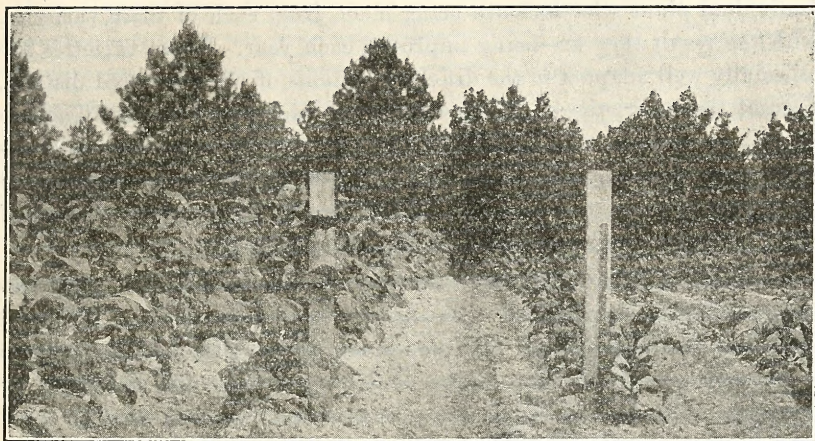


Fig. 3. GENERAL FERTILIZER EXPERIMENT, TOBACCO STATION  
 Left, Complete Fertilizer, N P K; Right, no Fertilizer



much as 100 pounds  $K_2O$  per acre seem to be profitable on the lighter soils.

7. *Tests with Magnesia, Sulphur and Chlorine for Tobacco.* It is quite evident that magnesia, calcium, sulphur and chlorine in limited quantities are essential to the development of a normal plant in addition to nitrogen, phosphorus and potash. There has been no evidence of manganese deficiency observed in the soils at the Station.

8. *Tobacco Variety Tests.* Out of approximately 200 varieties and selections, four outstanding varieties have been selected for the flue-cured district, viz., White Stem, Orinoco, Cash, Bonanza and Jamaica. Individual plant selections are being made from each of these varieties, with the result they are being improved each year. These varieties are especially well adapted to the different sections of the flue-cured district. Seed of these varieties are being distributed each year from the Tobacco Station to farmers who grow seed for sale. After supplying these requirements the remainder of the seed saved at the Station are distributed among the growers over the belt. From two to four pounds of each of these varieties were distributed during the past season.

9. *Tobacco after Cowpeas.* Tobacco of fair quality and yield can be grown after cowpeas and soybeans have been plowed under, if liberal applications of phosphates and potash are added, provided the tobacco is planted reasonably close in the drill, topped high and harvested by priming. The quality is not quite as good as tobacco grown on weed land with a complete fertilizer.

10. *Rotation System for Tobacco.*

#### *Rotations Used*

A four-year rotation with corn, oats and grasses and tobacco.

A three-year rotation with oats (Soybeans) and rye (seed) and tobacco.

A two-year rotation with oats or rye and tobacco.

Each of these rotations is adaptable to farms which have varying amounts of available land suited for growing tobacco.

11. *General Fertilizer Tests.* Cottonseed meal has stood up as one of the best sources of nitrogen with Nitrate of Soda next. Ammonia Sulphate gives good results on limed end of plats. A combination of organic and inorganic ammoniates is better than any individual source. Basic Slag and Bone meal are too slow for tobacco as a source of phosphate. Superphosphate is the best source.

12. *Plant Nutrition Investigations.* Cotton and corn give excellent results after all the legumes, but make larger yields after vetch and

clover than soybeans and cowpeas. In dry season it is more difficult to secure good stands of tobacco after vetch and clover where it is turned under late, than after legumes such as soybeans and cowpeas. On the other hand tobacco does best after weeds and grass.

13. *Different Sources of Potash with Dolomite and Calcite.*

The plats on which magnesium limestone (Dolomite) is used gives the best yield and quality with no "sand drown." On the other series "sand drown" occurs on all plats except where magnesium-potassium sulphate is used. The Kainit plats give a large yield of tobacco, but poor quality of leaf.

14. *Quantitative Magnesium Tests.* Approximately 20 pounds of available magnesia per acre will prevent "sand drown." This can be supplied by magnesium limestone or from potash salts.

15. *Tobacco Mosaic.* The result of this work is in manuscript form and will be published at an early date.

16. *Special Tobacco Studies.* During the summer of 1931 and 1932, Dr. C. W. Bacon, Chemist of the Office of Tobacco Investigations, U. S. Department of Agriculture, with whom the Station has been co-operating since it was established, spent several weeks at the Station collecting tobacco samples for chemical analysis and making studies of the curing process. This is work that is badly needed, and will be helpful in solving some of the problems of the tobacco grower.

17. *Small Grain.* The small grain crops that have been grown on the Station have been good. Purple Straw wheat, which has been grown on the Station during the past three years seems to be well adapted to this section. The Station averaged 32 bushels per acre for all the wheat harvested in 1932. This wheat was certified and has been sold for seed purposes. The yield of Abruzzi rye was also good, having yielded over 25 bushels per acre. Neither of these crops were fertilized in the spring.

18. *Corn Selection.* Selections have been made for several years of Weekly's Prolific corn with the result that it is now considered one of the best varieties for the middle Piedmont area. Seed of this variety has been registered by the North Carolina Crop Improvement Association and sold to growers over the State.

19. *Sheep.* A small flock of Shropshire sheep are kept at this Station to obtain cost data on handling and to assist local farmers in getting better and more sheep on their farms.



20. *Registered Jersey Bull.* This bull is kept for service in the community. Approximately 75 cows have been bred to him during the past two years.

21. *Swine.* This project is to determine the cost and returns from a small farm herd of hogs, and to furnish Berkshire breeding stock to farmers in the section.

#### IMPROVEMENTS

During the past two years practically no work has been done in the construction of new buildings, fences, etc., although all equipment has been kept in good repair. This repair work has been done by the regular farm labor.

#### GENERAL

The tobacco farmers of North Carolina are becoming better acquainted each year with the work that is being done at the Tobacco Station. This is evidenced by the large number of visitors during the year, and the daily inquiries which come through the mails. The Annual Field Day held in August, 1932, was attended by approximately 3,500 people. At the 1931 meeting approximately 4,000 people were present. A large number of those attending these meetings go to the experimental fields to study the results. It is not unusual to see four or five hundred people in the different fields at the same time. Over five hundred growers a year have visited the Station during January and February for the past two years for the purpose of having their seed cleaned and treated, and to get information on varieties. It is interesting to note that these visitors are not all confined to North Carolina, but come from other tobacco states, and a number each year come from foreign countries.

#### UPPER COASTAL PLAIN STATION—ROCKY MOUNT

R. E. CURRIN, JR., *Assistant Director in Charge*

Station established in 1902

Area of Station, 202 Acres      Soil Type, Norfolk Sandy Loam

##### *Climatological Data for 1931*

Elevation of Station Farm, 105 feet above sea level.

Mean Annual Temperature, 62.1 degrees Fahrenheit.

Annual rainfall, 50.01 inches.

Total snowfall, 4.2 inches.

The program of work with a brief summary of the results secured from each project is reported below.

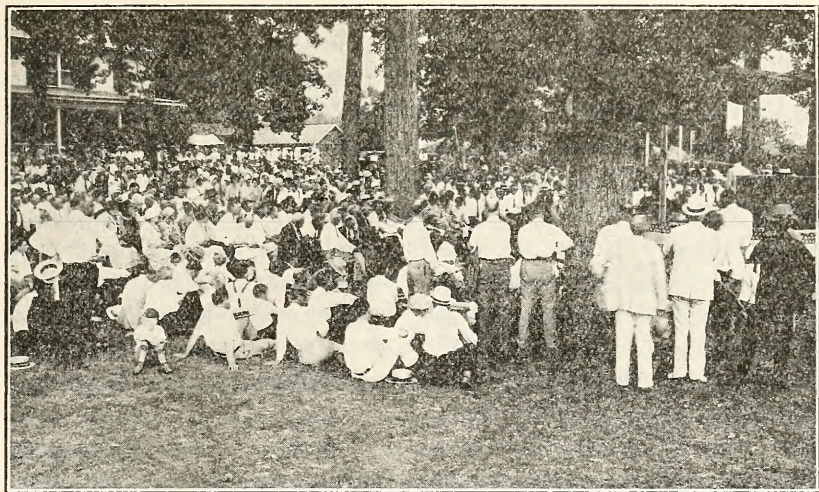


Fig. 4. MORNING PROGRAM AT THE FARMERS' ANNUAL FIELD DAY, TOBACCO STATION, July 23, 1931



Fig. 5. THE TOUR TO THE EXPERIMENTAL FIELDS IS A POPULAR FEATURE OF THE ANNUAL FIELD DAY AT THE TOBACCO STATION



## AGRONOMY

The tobacco experiments are handled in coöperation with the Office of Tobacco Investigations, U. S. Department of Agriculture.

1. *Tobacco Variety Test.* The Virginia Bright Leaf and White Stem Orinoco, seem to be the best varieties for this section, although the Bonanza and Cash varieties here show up well in the test.

2. *Tobacco Fertilizer and Rotation Studies.* The tobacco in a three year rotation of corn, cotton and tobacco has given better results than the tobacco in a two year rotation of cotton and tobacco, or the continuous tobacco plat. The fertilizer giving the best results contains 8 per cent phosphoric acid, 3 to 4 per cent nitrogen and 6 to 10 per cent potash.

3. *Side Applications of Fertilizers to Tobacco.* Small applications of nitrogen and potash or a complete fertilizer have shown good results. Where nitrogen was applied alone the tobacco had a tendency to green up too much. The side applications of potash alone seems to help some.

4. *Potash and Lime Experiments with Tobacco.* So far the use of lime has not increased the yields of tobacco on this soil type. A mixture of one-half Muriate and one-half Sulphate of potash substituting sulphate of potash magnesia in place of sulphate where sand-drown is prevalent, is recommended.

The following experiments are handled in coöperation with the N. C. Experiment Station.

5. *Nitrate of Soda—Sulphate of Ammonia Tests With Cotton.* The results indicate that there is very little difference in the efficiency of these two sources of nitrogen. **Deriving part of the nitrogen** from each source gave slightly larger yields than when either material was used alone as the sole source of nitrogen. (Closed 1932.)

6. *Fertilizer Ratio Experiment—Cotton and Peanut Rotation.* Varying the percentage of phosphoric acid from six to thirteen per cent in the fertilizer, the nitrogen from three to seven per cent, and the potash from two to six per cent, has had little effect upon the average yield of cotton and peanuts in this experiment.

7. *Rotation Experiment.* There are thirteen different rotations run in duplicate in this test. The experiment was started in 1924 to study the value of one, two, three and four year rotations with and without legumes. So far the corn and peanuts have responded most to the rotations. The increase in corn yields due to a three year rotation

where legumes are used has been as much as twenty bushels per acre over the continuous corn plat.

8. *Source of Nitrogen Study for Cotton.* The inorganic sources of nitrogen have given better results than the organic forms for cotton.

9. *Time and Method of Fertilizer Applications for Cotton.* This experiment is handled in coöperation with the U. S. Department of Agriculture and the National Fertilizer Association. The object of the test is to determine the effect of the different methods and time of applying fertilizer on the stand, growth and yield of cotton. The fertilizer distributing machine used in this test was designed by the U. S. Bureau of Public Roads. Applying the fertilizer ten days in advance of planting gave better control of fertilizer injury than any method used.

10. *Fertilizer Experiment with a Rotation of Corn and Soybeans.* This experiment was started in 1926 to determine the best fertilizer for corn, soybeans (for seed) soybeans (for hay) and to show the effect upon the succeeding crop of corn by picking soybeans for seed, remaining parts turned back for soil improvement, versus cutting the soybeans for hay.

The corn after soybeans, where only the seed was gathered, yielded as much as fifty per cent more than where the soybeans were cut for hay.

11. *Fertilizer and Dusting Experiments with Peanuts.* The object of this experiment is to determine the influence of fertilizer, lime and landplaster upon the yield and quality of peanuts. So far the lime and landplaster has not increased yields. Leaf spot has been more prevalent on the unfertilized areas. An 8-2-4 fertilizer applied at the rate of 400 pounds per acre has given increased yields over the no fertilizer plats.

12. *Utilization of Crops.* The object of this experiment is to compare crop yields, financial returns and fertility of the soil under two methods of utilization of crops. A three year rotation of, corn and soybeans, cotton with crimson clover and rye; soybeans followed by crimson clover and rye. By the first method all crops are hogged off, except cotton, while by the second method certain crops are harvested, while others are turned under for soil improvement. Where the corn and soybeans are hogged off the yield of cotton in the rotation is increased some over where the corn and soybeans are harvested.

13. *Cotton Breeding Studies.* Selection work for higher quality of staple, better yields and better adaptation to boll weevil conditions



is being continued. The Mexican Big Boll variety is grown exclusively. Each year three hundred to six hundred bushels of registered seed are distributed to farmers at a reasonable price. This variety has proven to be one of the best 1 1/16 inch staple cottons for growing under North Carolina conditions. The grade and staple premium on our Mexican Big Boll cotton last year averaged 15 per cent, or approximately one cent per pound, figured on a middling 7/8 inch staple basis.

14. *Peanut Improvement Work.* Selections are made each year for improving the quality and yield of peanuts using the standard varieties.

15. *Corn Selection.* The Latham Double variety of corn is grown exclusively at this Station. Each year field selections are made to improve the yield and quality.

16. *Boll-Weevil Control.* This project is at present limited to controlling boll-weevil on the Station's cotton, and assisting farmers, County Agents and Vocational Agricultural Teachers in this control work.

#### HORTICULTURE

17. *Pecan Varieties.* The pecan trees in this test of twenty-five varieties are twenty-seven years old. The results show that the Schley, Stuart, Alley and Money-maker varieties succeed best in this section.

18. *Sweet Potato Storage.* This work has clearly demonstrated the value of the Government type of a sweet potato storage house, also the value of storing potatoes in crates versus bins. It has paid to buy the crates in every instance.

#### LIVESTOCK

19. *Sheep.* This project deals primarily with the raising of lambs for early market and to determine the best methods for handling the small flock in the utilization of pastures and cover crops.

20. *Hogs.* The swine herd consists of three duroc Jersey sows and a boar. Records are kept on the cost of carrying over brood stock. The pigs are used in the utilization project outlined under agronomy.

#### IMPROVEMENTS

Owing to a greatly reduced budget no improvement work has been undertaken during this biennium. It has not been possible to even keep up urgent repairs.

## GENERAL CROPS AND GARDENS

After the experimental work has been provided for, all available land is planted to feed crops in order to produce feed for the work-stock and for the livestock on experiments. In addition every man living on the Station is assigned land for his garden. In fact our tenants are required to have good gardens.

## ANNUAL FIELD DAY

This Station is being used more by the farming public each year. There is hardly a day that we do not have visitors seeking information on some phase of agriculture. The County Agents bring groups of farmers each year to study the work of the Station and the Vocational Agricultural Teachers bring their classes to obtain instruction in modern agriculture and to look over our experiments.

The Annual Farmers Field Day is the big day of the year, and the last meeting on August 11, 1932, was successful in every way with approximately fifteen hundred people present. The farmers of this section look forward to this Field Day and we try to arrange the program each year so that it will be instructive, as well as entertaining to all present.

## BLACKLAND STATION—WENONA

J. L. REA, JR., *Assistant Director in Charge*

Station established in 1912

Area of Station, 200 Acres      Soil Types, Peat and Muck

*Climatological Data 1931*

Elevation of Station Farm, 16 feet above sea level.

Mean Annual Temperature, 60.6 degrees Fahrenheit.

Annual Rainfall, 47.31 inches.

Annual Snowfall, 5 inches.

In addition to the two hundred acres owned by the Department of Agriculture, the Station is renting eighty acres of land for the production of feed for the extensive livestock experiments and one-hundred and sixty acres of reed land adjacent to the Station are used each year for grazing beef cattle.

The experiments underway with a brief progress report is given below.

The livestock projects are handled in coöperation with the U. S. Department of Agriculture and the N. C. Experiment Station.



1. *Quality of Meat Studies.* Calves out of native cows and by pure bred Hereford bull graded higher as feeders, as slaughter cattle and in the carcasses, than calves out of the similar native cows and by a native bull.

2. *Improvement in Native Cattle by Use of Pure Bred Hereford Bull.* First cross Hereford yearlings were 9 per cent heavier when put into the feed lot; gained 32 per cent more rapidly and required 14 per cent less feed per unit of gain than native yearlings.

3. *Value of Native Reeds as a Pasture for Beef Cattle.* Ten acres of native reeds furnished sufficient grazing for 12 yearling steers from June 1 to December 1. The steers could have been turned on the reeds earlier if a bad fire in March had not destroyed the old growth. Drought did not damage the reeds as badly as it did tame permanent pasture.

4. *Gleaning Studies with Beef Cattle.* Dry cows carried in corn stalk fields from December 31 to February 25 (56 days) made an average gain of 17 pounds. The carrying capacity of the stalk fields was 25 cow days per acre or 58 cow days per 100 bushel yield.

5. *Cost of Raising Pigs to Weaning Age.* Results published in North Carolina Agricultural Experiment Station Bulletin No. 272.

6. *Cost of Carrying Breeding Herd of Hogs.* Cost data is recorded on carrying a breeding herd of hogs under general farm conditions.

7. *Cottonseed Meal as a Supplement to Corn for Fattening Pigs.* A protein mixture composed of equal parts of fish meal and cottonseed meal and self fed free choice with corn and mineral to pigs, increased the daily gains 12 per cent and increased the profit 24 per cent over a protein supplement consisting of fish meal alone.

8. *Yellow Versus White Corn for Fattening Pigs.* Fall farrowed pigs, when fattened on yellow corn; required 22 pounds less feed per cwt. gain, made \$1.80 more profit per pig, and gained more rapidly than similar pigs that were fed white corn.

9. *Improvement of Family Cow by Pure Bred Sire.* A registered Guernsey bull is maintained on this Station for community service. During the past three years 175 cows in the community have been bred and a number of promising heifers are coming into milk. The project has been of great value to this section, and has created an interest in better milk cows.

10. *The Farm Flock.* A small flock of sheep are kept on the farm to round out the livestock program as sponsored by the Station. In-

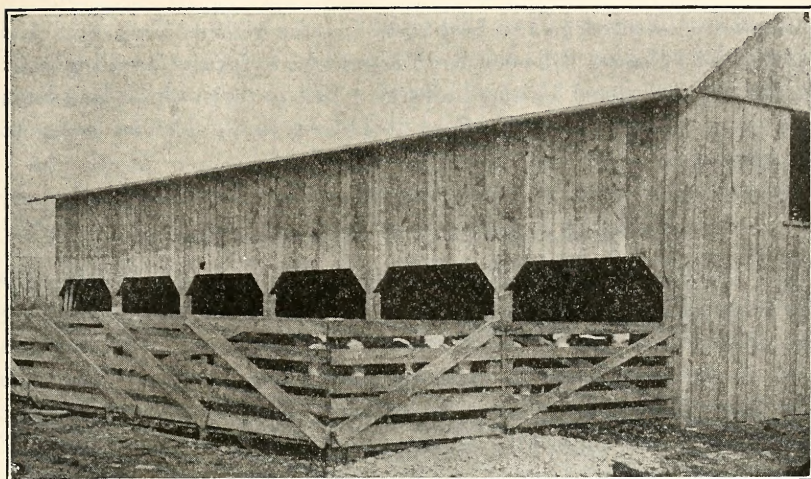


Fig. 6. BEEF CATTLE BARN AND PENS AT BLACKLAND STATION WHERE DRY LOT  
FEEDING TESTS ARE CONDUCTED



Fig. 7. GROUP OF CALVES FROM NATIVE BULL, BLACKLAND STATION



formation is secured on the feed costs and the returns from wool and lambs. The Station will soon be in a position to furnish breeding stock to farmers interested in the industry. Sheep thrive in this section and every farmer can well afford to have a small flock of sheep in his program.

#### AGRONOMY

##### *Coöperating with the N. C. Experiment Station*

11. *Fertilizer and Crop Rotation Studies.* This test is to determine the value of commercial fertilizers on the blacklands, and to compare the efficiency of the different sources of phosphates. The rotation used in the experiment is corn, oats and Irish potatoes. The oats and Irish potatoes are followed by soybeans. Phosphates from different sources have not materially increased the yield of crops. Nitrate of Soda and Superphosphate when used together have given lower yields than plats receiving no fertilizer. Potash is the most essential plant food needed.

12. *Cultural Treatments of Corn and Soybeans.* The object of this experiment is to determine the best cultural practices for growing such crops as corn and soybeans. The results show that there is no benefit derived from rolling this muck soil. Flat cultivation has shown to be better than ridging, except in an extremely wet year when ridging was better. As a general practice the flat cultivation has been decidedly better than ridging. Deep plowing has not proven to be superior to disking.

13. *Lime Tests.* This experiment consists of 24 plats. The lime treatments are applied once every three years in the form of marl, hydrated lime and finely ground limestone at the rate of one, two, three and four tons per acre. The results show that finely ground limestone applied at the rate of two tons per acre gives best results. However lime in any form has given increased crop yields.

14. *Manganese and Copper Sulphate Studies.* Results so far are not conclusive that either element will increase the yield of corn sufficient to justify the expense.

15. *Pasture Grass Fertilizer Test.* The results of one year test show that a complete fertilizer gave the largest yield of grass hay, but this increase yield over the plat receiving no fertilizer is not sufficient to justify the fertilizer expense.

16. *Corn Variety Test.* Of the number of varieties tested, the Highland Horse-tooth (white) and a strain of the Jarvis Golden (yellow) seem best suited to this soil type.

17. *Seed Corn Selections.* The Highland Horse-Tooth and the Jarvis Golden varieties have been field selected each year for a smoother grain and better yields. As a result the yields have been gradually increased and the quality improved.

18. *Small Grain Tests.* The object of this work is to compare the value of different varieties of small grain for cover crops and grain yields on the blacklands. Results show that it is best to seed oats in the spring; fall plantings are usually damaged by winter killing. Abruzzi rye stands the winter well and furnishes excellent spring grazing. Both barley and wheat have been badly winter killed.

### IMPROVEMENTS

During 1930-31, thirty acres of land were cleared and brought into cultivation. The entire farm of two-hundred acres is now in cultivation and most of this is tile drained. As soon as funds will permit, the remainder of this area should be drained as the results of our drainage tests show that the increased yields due to proper drainage will in the course of a few years more than pay for the tile drainage costs.

On March 22, 1932, a serious forest fire destroyed one of our cattle barns and contents. The barn was covered by insurance, and has been replaced with a modern cattle barn, suitable for handling the beef cattle experimental work.

### CROPS AND LIVESTOCK

- 160 acres planted to corn
- 40 acres soybeans for hay
- 10 acres soybeans for seed
- 15 acres Agronomy experimental plats
- 22 acres Tame pasture
- 160 acres reed pasture
- 2 acres gardens
- 90 head beef cattle
- 17 brood sows and 1 boar
- 12 ewes and 1 ram

### PUBLIC RELATIONS

The work of the Station is generally followed by the blackland farmers. As a result of the feeding and management studies with hogs many of the farmers of this section are now raising hogs using the best practices determined by the Station. As many as forty car-loads of hogs are marketed each year from this area. The work with beef



cattle and sheep is being followed closely by our farmers, and many are *growing* into this phase of livestock farming.

The blackland farmers are now convinced that it is impossible to hold up to the original yields of crops on this soil type without the use of lime and fertilizer, and the results of our lime and fertilizer tests are being put into practice more each year.

The Station has many visitors during the year seeking information on farming. The Annual Field Day held on the first Thursday in August has been helpful in giving our people the benefit of the work of the Station. The attendance this year was approximately 2,000 people.

### COASTAL PLAIN STATION—WILLARD

(On State Highway No. 401)

CHARLES DEARING, *Assistant Director in Charge and Associate  
Horticulturist, U. S. D. A.*

Station established in 1905

Area of Station Farm, 273 Acres      Soil Type, Norfolk Fine Sandy Loam  
*Climatological data for 1931*

Elevation of Station Farm, 51 feet above sea level.

Mean Annual Temperature, 63 degrees Fahrenheit.

Annual rainfall 38.1 inches.

Total snowfall, 3.2 inches.

The following is a summary of work underway at the Coastal Plain Station with brief statements as to object and result during the biennial period. Some projects listed in the previous biennial report have been discarded owing to the necessity of operating under reduced budgets. Others have been completed and because of economies new projects have not replaced them. At the beginning of this calendar year it was necessary to reduce the investigational program from 64 projects to 29 projects owing to the reduced financial support.

### AGRONOMY

1. *Soil Fertility Investigations.* In coöperation with the N. C. Experiment Station. This long time project has been continued and continues to show the importance of complete fertilizer containing nitrogen, phosphoric acid, and potash under soil conditions of the region. Lime while tending to cause increased yields, especially when applied in conjunction with organic matter, has been definitely associated with chlorosis due to deficiency of manganese. The test suggests the need

of avoiding excess applications of lime on sandy types of soil as such applications can render manganese insoluble resulting in chlorosis.

2. *Soil Type Investigations.* This work in coöperation with the N. C. Experiment Station is a part of a general test being conducted at all of the State's Test Farms and is for the purpose of comparing the fertilizer requirements of the various soil types of the Station. The importance of keeping up soil fertility through the use of legumes, application of manure, growing of winter cover crops and other means of fertility maintenance has been emphasized by these tests, but the use of excess applications of commercial fertilizers has been shown to be unprofitable.

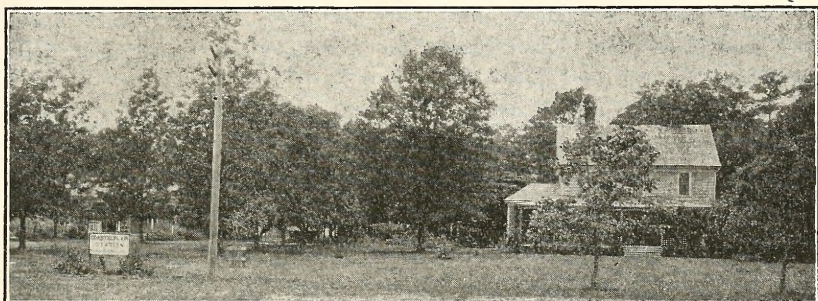


Fig. 8. SUPERINTENDENT'S DWELLING AND OFFICE BUILDING AT THE COASTAL PLAIN STATION

3. *Corn Variety Test.* In coöperation with the N. C. Experiment Station over twenty varieties of corn have been tested in three replications. In 1931 Latham's Double was the outstanding white variety and Indian Chief the outstanding yellow corn. In 1932 Cocke's Prolific was the outstanding white corn and Golden Dent the outstanding yellow corn. The conditions during 1932 tended to favor early maturing varieties. This may account for the Cocke's Prolific and Golden Dent out yielding Latham's and Jarvis' in 1932. Further tests will be needed in order to determine the corn which will be outstanding in the majority of years.

4. *Corn Selection Work.* In coöperation with the N. C. Experiment Station. While weather conditions may have influenced results of 1932 corn tests, it is significant that as the selection work on the Cocke's Prolific variety goes ahead in this selected strain of the Cocke's Prolific is increasingly outstanding in the corn variety tests. It is hoped in



time to develop from this strain the finest and most productive corn for Southeastern North Carolina.

5. *Corn and Soybean Planting Test.* In coöperation with the N. C. Experiment Station. The study of the planting methods for corn and soybeans comparing the two crops planted separately in alternate rows and in the same row has been continued. This project, started during the last year of the previous biennial period, will have to run for a number of years before it will give conclusive results.

6. *Winter Legumes.* While it was found necessary to abandon the coöperative project with the N. C. Experiment Station, the results of the winter of 1931-32 did not show the Austrian winter pea to have any great merits over vetch as a legume to accompany plantings of rye and oats for grazing and hay, respectively. Experimental tests have been abandoned, but observations will be made on general field plantings.

7. *Value of Special Grasses and Legumes Under Southeastern North Carolina Conditions.* Before putting this project on a no-cost basis the fact that centipede grass lived over winter at the Station during the mild winter of 1931-32, and the possibility of getting reseeding of Italian rye grass by refraining from cutting until mid-summer in order to let the seed fully ripen has been suggested. Where this grass has been used on lawns, it has heretofore not reseeded itself. Farmers could perhaps plant the grass in field plantings with a view to producing seed needs for their own winter lawns.

#### FORAGE CROPS

At the beginning of this biennial period important coöperative relations were established with the U. S. Department of Agriculture for forage crop investigations. It is believed that these investigations are fundamental to the development of the livestock industry in Eastern North Carolina, as the production of home grown forage is essential to the success of any kind of livestock work. As a result of the establishment of this project certain projects of this type which had formerly been conducted in coöperation with the State Experiment Station were transferred to government coöperation.

8. *Soybean Investigations.* In coöperation with the U. S. Department of Agriculture. Following the recommendation of Herman, Tokyo, Biloxi as feed beans, and Virginia and Otootan as the hay beans for Southeastern North Carolina as a result of investigations during the previous biennial period, the Station is now ready to recommend

and to introduce the Nanking soybean. At the present time, in addition to the testing of named varieties, over four hundred new introductions from Manchuria, China, resulting from the explorations of the U. S. Department of Agriculture, are being tested out under North Carolina conditions as a part of this coöperative project.

9. *Crotalaria Tests.* In coöperation with the U. S. Department of Agriculture tests of a number of types of *crotalaria* indicate that this new type of plant does have importance in relation to North Carolina agriculture. The plants, while apparently offering no immediate outlet as a green forage (one or two strains probably accepted) seem to offer real value to the North Carolina farmer as plants for soil improvement because of the remarkable amount of organic matter which they provide to turn into the soil. It is possible that the dried and cured growth may also have feeding value. Tests of this will be made in the course of the project. The tests have also demonstrated the remarkable ornamental and floral values of the *crotalaria* and certain florists of the State have already put these species into commerce through their floral business and in doing so have profited. Many of the types have developed a keen interest from sportsman and land-owners because of their possible value as food for game preserves and hunting grounds.

10. *Lespedeza Tests.* In coöperation with the U. S. Department of Agriculture. After demonstrating the relative value of the Kobe, Tennessee 76, Common and Korean *lespedeza*, a test which favored the Kobe and Tennessee, our *lespedeza* work has veered to the study of the perennial *lespedeza*. At the present time the Station has plantings of *Lespedeza Serecia* which are two years old and thriving, and nearly an acre of one year old *Lespedeza Serecia* which will be harvested for seed with the view to using the seed for further tests and for introduction.

11. *Kudzu Tests.* These tests have been started, the first problem being to compare the value of various types of planting stock such as seed, young root stocks and old root stocks.

12. *Winter Forage Crops.* A large number of types of vetches, lupines and winter peas have been put under test, but it is too soon to form conclusive results.

13. *Forage Nursery Studies.* Over 250 species of leguminous plants are being grown and tested with a view to studying their possibilities as forage crop plants, plants for the protection of the soil against erosion, plants for ornamental purposes for the use of florists, for value



as food plants for game and various other uses. This project requires careful attention and note taking during the growing periods and the harvesting of seed and hay samples, the taking of yield records and the conducting of laboratory tests from year to year. Plants in this nursery have come from all over the world, and it is important to have these plants tested under our own agricultural conditions. Although this nursery has been running but two years, various North Carolina individuals have already profited from observations personally made and the records taken, and they have proceeded to undertake the culture of certain of the species.

#### ANIMAL INDUSTRY

*Dairy Investigations* in coöperation with the State Experiment Station have taken the following lines:

14. *Use of Fly Repellants in Relation to Milk Production.*
15. *Herd Development with Special Reference to Improvement of the Use of Better Sires.*
16. *Cost of Maintaining the Herd Sire.*
17. *Farm Dairy Refrigeration Studies.*
18. *Study of Feeding Rations With a View to Determining Best Usage of Home Grown Feeds.*

Results from the dairy investigations are being reported through the State Experiment Station. Investigations are conducted and financed at the Coastal Plain Station.

*Swine Investigations* in Coöperation with the State Experiment Station Relate to:

19. *Cost of Raising Pigs to Weaning Age.*
20. *The Family Sow—Cost and Maintenance and Returns.* The swine work is maintained as a small project in order that it will not compete with the dairy investigations for feed supplies. It is furnishing valuable information relative to the maintenance of swine as part of a live-at-home program.

21. *Sheep Investigations.* In coöperation with the State Experiment Station. A small sheep project has been started with a view to the conduct of a small flock as a branch of diversified farming under Southeastern Carolina conditions. During the period some trouble with parasitic worms was encountered in 1931, but by the use of recommended drenching methods these troubles were avoided in 1932.

22. *Poultry Investigations.* In coöperation with State Experiment Station. This project is in course of revision and curtailment as to

projects. During the past year special emphasis has been placed on the flock improvement project for which careful reports are being kept with a view to establishing pedigree records and developing increased production also to the capon investigation project in which studies as to methods of caponizing and avoiding slips. The cost of producing marketable capons and methods of marketing are being investigated. In the new program of work efforts will be made to produce good capons at less feed costs by use of foraging or pasturage methods of providing feed in lieu of a proportionate part of the grain and mash allowance.

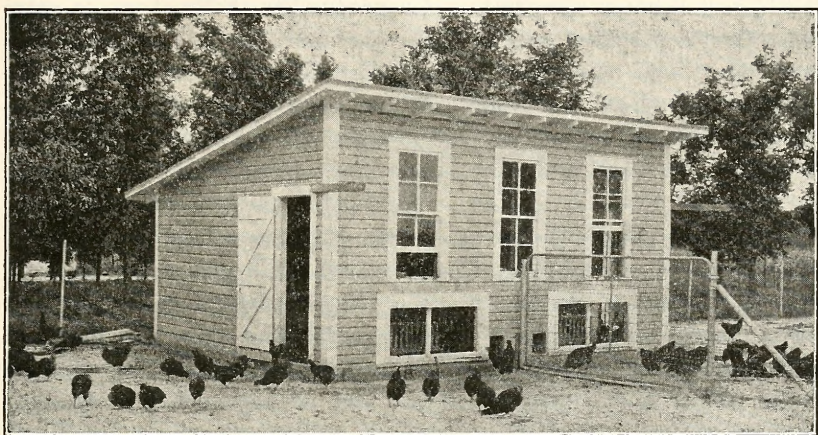


Fig. 9. THE TYPE OF BROODER HOUSE USED IN THE POULTRY EXPERIMENTAL WORK AT THE COASTAL PLAIN STATION.

### FORESTRY

23. *Forestry Management Demonstration.* This project conducted by the Station relates to the handling of the woodlands on the average farm and is serving to demonstrate the importance of proper management of these woodlands as a part of diversified farming.

### HORTICULTURE

Under reduced budgets the number of horticultural projects have been greatly decreased. For financial reasons the following projects have been dropped.

Lawn Management, Landscape Development, Japanese Persimmons, Tomato, Dahlia Test, Rose Test, Peony Test, Hardy Chrysanthemum Test, Truck Crop Fertilizer Studies, Lettuce Investigations, Apple Breeding and Testing, Cucumber Tests, Pyrethra Tests, Cantaloupe



and Watermelon Tests, and other projects have been put upon a self maintaining basis such as the Asparagus Demonstration, test of miscellaneous plants and varieties such as the Strawberry Demonstration, etc.

The horticultural projects of the Station considered most important to the section have been continued.

24. *Sweet Potato Investigations.* In coöperation with the State Experiment Station. As a result of the sweet potato investigations at this Station, the following recommendations and results have been obtained: Spacing tests indicate 12 inches between plants and 3 feet to 3½ feet between rows is best for production of No. 1 grade potatoes. Over a period of years a high ridge will give greater yields than low ridge. The removal of vine cuttings from one plant during the summer will reduce the yield from that plant in direct proportion to the number of vines removed. Tests suggest the use of an 8-4-8 formula fertilizer. The best time for setting sweet potato sprouts is between the first and fifteenth of June. Late plantings give reduced yields. Vine cuttings planted at the same time as draws will produce greater yields, however, draws planted early in June will give a greater yield than vine cuttings planted in July. Sweet potatoes should be harvested before the first heavy frost in order that they will carry in storage with less amount of rot. Storage in crates will give much better results than storage in bins. Out of approximately 40 varieties tested, the Porto Rico is indicated as the best variety for North Carolina conditions. Over a period of years, by careful hill selection, a strain of Porto Rico superior to any Porto Rico stock which has been tested in North Carolina has been produced. This strain has outyielded other strains by 20 per cent of No. 1 potatoes.

25. *Blueberry Investigations.* In coöperation with the U. S. Department of Agriculture. The Station has continued investigations relating to the culture of the native huckleberry or blueberry as a cultivated commercial crop. The use of sand and sawdust in propagating beds has shown to be much superior to the use of peat, as commonly practiced heretofore. Additional blueberry growers from New Jersey and other sections have taken interest in the possibilities of North Carolina blueberry culture. One of these parties during the last year has definitely purchased a large tract of land (800 acres) suitable for blueberry culture and will become another unit in the demonstration of the possibilities in commercial blueberry culture under our conditions.

26. *Muscadine Grape Investigations.* In coöperation with the U. S. Department of Agriculture. The Station has continued its work re-

lating to Muscadine grape breeding, utilization, pruning, fertilization, culture and propagation. In 1931 the Station vineyard produced the largest crop of grapes it had ever borne. In 1932, while the crop is the smallest the Station has ever had, owing to rains and continuous drought, at other seasons since the bumper crop of 1931. Nevertheless the yield records have demonstrated the value of cultural and pruning methods being used, for while the crop is smaller than usual, the properly managed vineyard at the Station is almost the only source of Muscadine grapes in any abundance to be found in the section.

27. *Bulb Investigations.* In coöperation with the U. S. Department of Agriculture. This project is in support of the bulb industry in Southeastern North Carolina. Tests of over one hundred varieties of Narcissus are proving out the varieties best adapted for Southern conditions. It has been clearly demonstrated that Southern grown bulbs will force earlier than Northern grown bulbs. Studies of Dutch Iris indicate the importance of early digging in order to control diseases that cause the rotting of bulbs.

28. *Bulb Disease Control.* In coöperation with the U. S. Department of Agriculture. The use of various disinfectants in powdered and liquid form have been tested and methods of a practical value have been worked out and are being adopted by commercial growers. The result of this investigation has been published in the florists' trade papers.

29. *Raspberry Breeding.* In coöperation with the U. S. Department of Agriculture. A large number of crosses between high quality Northern raspberries and vigorous growing foreign species have been made and promising seedlings fruited during the summer of 1932. It is hoped that certain of these seedlings will thrive under the warm summer conditions and prove their adaptability for Southern planting.

30. *Strawberry Breeding.* The large coöperative project with the U. S. Department of Agriculture relating to the breeding of strawberries for better varieties has been continued on a comprehensive scale based upon the production of from fifty to one hundred thousand seedling strawberries per year, and the selection of the better plants from these seedlings, the gradual elimination to the few best and the propagation of these and their introduction. The introduction of the Blakemore strawberry was reported in our last biennial report. This variety has become a leading variety in the Southeastern part of the State, and in fact is being grown now throughout most of the strawberry districts of the United States. During the past season on the



Wallace cash auction market, the Blakemore averaged 50 cents per crate for the season above the Missionary variety, which had been the commercial variety in the section and is still extensively grown. It was estimated by those in control of the market that 20 per cent of the total fruit purchased at auction during the shipping season was Blakemore. At this rate of increase the variety will virtually supplant other varieties in the course of another biennial report. During the past biennial period two other varieties have been introduced. These are the *Southland*, an exceedingly beautiful and choice variety recommended for home planting in the South and for local markets, and the *Bellmar*, which is of the same parentage as the Blakemore, but later in season.

#### IMPROVEMENTS

While the financial difficulties have necessitated reduced budgets and this in turn has prevented the making of improvements from year to year, in accordance with the general policy, which has been followed since the Station was established, one definite concrete improvement was made during 1931 under a special allowance from the Budget Bureau. This was the erection of a dairy barn on the foundation of the previous barn which collapsed. Along with the rebuilding of the barn, the fertilizer shed was remodeled, the mule barn repaired and the dairy lot fence replaced. This improvement has done much to help the looks of the Station, but at the same time it has demonstrated the need of painting and repair to other buildings nearby constituting the unit of buildings of which the boarding house is the principal one. The boarding house and the office are showing the need of paint and their yellow color contrasts badly with the steel gray with white trimmings of the new buildings. It is recommended that at the earliest possible time these other buildings be painted so that there will be uniformity as to appearance and preservation of the buildings. The roof of the Superintendent's and Dairyman's houses are leaking badly and guttering on the Superintendent's house needs repair. An improvement off the Station, but of definite value to the Station, has been made in the form of improved public roads under the control of the State Highway forces.

#### FIELD DAY

The Station has continued to conduct special days or schools for the purpose of bringing farmers and others interested in particular subjects together. For example just recently a special day was set aside for Duplin County farmers and specialists from Raleigh, Washington,

D. C., and elsewhere assembled in order that they could speak to this group. On this occasion there was an attendance of around three hundred individuals. The Negro Farmers' Field Day had an attendance of over five hundred. The most important day at this Station is our Annual Field Day. The attendance in the year 1931 was approximately seven thousand people, and the attendance in 1932 was approximately eight thousand people. This figure was based upon a tally of vehicles and people as they entered the Station premises. On the occasion of the 1932 Field Day an agricultural program for Eastern North Carolina was inaugurated along lines comparable with the Minnesota and Western North Carolina plans. In attendance at the conference relating to the establishment of the program for this occasion were representatives of the Southeastern Council, the State Extension Service, Eastern Chambers of Commerce, newspaper editors of Eastern North Carolina, agricultural representatives of railroads, representatives of the U. S. Department of Agriculture, and various other interested parties. An interesting and instructive speaking program was carried out. Various demonstrations, educational exhibits, educational contests, etc., were a part of the day's program.

In closing this report, I wish to express my appreciation of your generous support of our Test Farm work and to acknowledge the loyal and efficient service rendered by the members of this division.

Respectfully submitted,

F. E. MILLER,  
*Director, Test Farms.*



## DIVISION OF ENTOMOLOGY

*To the Commissioner of Agriculture:*

SIR: The following is the biennial report of the activities of the Division of Entomology. The division is charged with various regulatory and control matters pertaining to insects and diseases that affect man, plants and animals.

### NURSERY INSPECTION WORK

There were 184 nurseries certified as free of dangerously injurious insects and diseases in 1931. A total of 206 nurseries was inspected, but some of these were not being actively operated. Several nurseries required two or more inspections before they were certified, since they were not found in proper condition at the first inspection. The inspection fees amounted to \$1,234.60.

In 1932, a total of 207 properties was inspected. To date 95 of these have been certified in full, since the inspection fee has been paid.

The annual fee for inspection of nurseries now in effect is as follows:

One to three acres .....	\$ 5.00
Four to ten acres .....	7.50
Eleven to fifteen acres .....	10.00
Sixteen acres .....	12.50
and 10 cents for each additional acre.	

A fee of \$5.00 is added to the regular inspection fee for each subsequent inspection found necessary.

It is of interest to report that the ornamental and fruit stock of the nurseries of the state are maintained in unusually good condition. The nurseries have increased in number and acreage yearly somewhat as follows:

Year	Number of Nurseries	Number of Acres
1920 .....	53	685
1925 .....	92	1,219
1931 .....	184	1,715

No unusual insects were encountered in the nursery inspection work during the past biennium. The finding of the Japanese beetle in this state during the summer of 1932 indicates that our nurserymen will soon have to contend with a major insect pest.

## PERMIT TAGS FOR OUT-OF-STATE NURSERIES

A total of 34,720 permit certificate tags was mailed to out of state nurseries during the season 1930-1931 to 218 nurseries, the receipts for which amounted to \$506.95. During the season 1931-1932 a total of 29,407 tags was mailed to 217 nurseries, the receipts for which amounted to \$404.81. The tags are priced to the nurseries at approximate cost. They are issued to the nurseries after a duplicate of their inspection certificate is filed with the department. They are for attachment to shipments of nursery stock sent into our state.

## NATIVE PLANT COLLECTORS' PERMITS

Collectors and sellers of wild native plants who operate upon a commercial scale are required to secure a plant collector's permit, the annual fee for which is \$10. Copies of the permit issued must be printed upon shipping tags, and such a tag attached to each gift, sale or shipment of wild native plants. During the season 1930-1931, a total of 51 permits was issued. During the shipping season of 1931-1932, a total of 41 permits was issued.

The business of gathering wild native plants and selling or transplanting them in nurseries has expanded enormously in recent years. The largest collector in this state may ship as many as 200 carloads annually of rhododendron, kalmia, azalea and other kinds of native plants to foreign countries and within the United States.

Members of this division make occasional inspections of native plants while they are still growing in their native habitat. We are also called upon frequently to make inspections of native plants just before they are loaded in cars, and to certify them as free of insects and diseases. Efforts are also made to restrict the movement of native plants when in violation of the regulations of the department.

During the past biennium rather severe damage to rhododendron was observed during the summer seasons by the Lace bug *Leptobyrsa rhododendri*. Studies which led to a knowledge on the practical control of this pest were made at Pineola in July and August, 1931. Several spray combinations were applied to rhododendron plants in a nursery at Pineola and two of them were found effective. It was determined that a spray of four ounces of Nicotrol and one tablespoonful of nicotine sulphate in five gallons of water, killed the lace bugs when they were wetted with the spray. This information was sent to all commercial growers and collectors of rhododendron plants.



Many special permits for individual shipments of native plants are issued during the shipping seasons. Such a permit tag is sent upon request made to the department.

#### INSECT SURVEY OF NORTH CAROLINA

A survey of the insect fauna of our state was begun by the entomology division of the department in 1902. The work occupies the half time of one assistant and others at short intervals. Insects are deliberately sought and collected, while others are sent to the division for identification. Specimens are kept mounted and assembled in insect boxes. Our state now has the largest number of insects recorded of any in the southeast. References to the collection are made frequently by entomologists of this and other states.

During the past biennium to September 15, 1932, 326 species of insects and 116 species of "near" insects were added to our State list. The total number of species of insects now known to occur in the State is 8,541. If the "near" insects (spiders, mites, etc.) are included, the total is 8,945 species.

The list of North Carolina insects is in manuscript form. It is hoped that it will soon be made available in printed form for public distribution.

#### PHONY PEACH DISEASE ERADICATION AND TRANSIT INSPECTION WORK

The presence of the phony disease of peach trees in North Carolina was briefly referred to in the last biennial report. In the summer of 1931, a corps of inspectors affiliated with the Bureau of Plant Industry of the U. S. Department of Agriculture, coöperating with an assistant of this division, inspected a total of 284 commercial peach orchards containing 1,680,386 trees. Twenty-one counties were scouted. In addition to the commercial orchards, a number of home orchards were scouted. A total of 12 infected trees was found in eight commercial orchards, and ten infected trees were located in home orchards. All of the infected trees (22 in number) were condemned and cut down.

The inspection for this disease has given the Department an accurate census of the commercial peach orchards, the number of trees, their variety and age.

Effective November 30, 1931, the U. S. Department of Agriculture extended its quarantine number 67 relating to the movement of peach trees, etc., from an infected or a quarantined area to a non-infected area. The extension of this quarantine included North Carolina. The Board of Agriculture of our department consequently authorized Quar-

antine number 5 to be effective December 15, 1931. This quarantine governs the intrastate movement of peach trees, peach roots, nectarine trees or roots, or any kinds or varieties of trees or shrubs grafted or budded upon peach or nectarine roots under the prescribed regulations.

Transit inspection work was conducted at odd times during the winter 1931-1932 by members of this division in coöperation with inspectors of the Federal Bureau of Plant Quarantine. This work was done at Hamlet, Salisbury and Rocky Mount, primarily to observe nursery stock movement by express and freight, and to ascertain whether the Federal quarantine and our State quarantine on the Phony peach disease were being violated.

A total of approximately 2,000 shipments of nursery stock was observed by one federal and two of our own inspectors, during the period of February 25 to March 19 in which the movement of stock was presumably heaviest. About 295 of these shipments were destined for points in this State. Although 55 minor violations of the nursery regulations of this State were observed, none of them represented violations of our phony disease quarantine.

In 1932, inspection for phony disease of peach trees was limited to commercial orchards found infected in 1931, orchards adjacent to those found infected in 1931, and to home orchards in Wadesboro and vicinity where considerable phony disease was found in 1931.

The inspection work was again done by a crew of three men of the Federal Bureau of Plant Industry coöperating with an assistant of this division.

A total of 119,982 peach trees in 25 commercial orchards was examined and only one phony tree was found. The phony tree was destroyed. This scouting was done in seven counties.

A total of 13 home orchards containing 163 trees in Wadesboro was scouted and 17 trees found phony. These infected trees were condemned and cut down. Further scouting in Wadesboro will be necessary next year before eradication of the disease in this State is completed, and before North Carolina can be released from the provisions of the Federal quarantine.

#### NARCISSUS INSPECTION AND STERILIZATION

The regular post-flowering and harvest inspections of all commercial narcissus plantings were made during the past biennium. This work has increased greatly because of the finding of the genuine narcissus eelworm in several plantings. Time is also required to supervise the



hot water treatment of such infested bulbs as the growers may desire to ship, and of all narcissus imported from other countries. It appears that the division will require additional help on this phase of our work another year.

During 1931, a total of 24 commercial plantings was inspected. Of these 24 plantings, 5 light infestations by *Tylenchus dipsaci* (the narcissus eelworm) were found in parts of as many commercial plantings. Six plantings were found infested with the lesser bulb fly and two with the narcissus bulb fly.

Because of the eelworm infestation, 2,498 bushels of narcissus were sterilized with hot water under our immediate supervision, and 98 bushels were fumigated to kill the bulb flies. Two growers having some paperwhite narcissus very heavily infested with *Tylenchus*, buried and treated with oil, 850 and 60 bushels respectively under our supervision and at our recommendation.

The season 1931 marked the first definite finding of the eelworm in narcissus in our State. It was advisable therefore, for this State to erect a quarantine, regulating the movement of narcissus within the State. This was done by the Board of the State Department of Agriculture, and Quarantine number 6 of the plant pest regulations was made effective July 15, 1932. It closely parallels the federal quarantine and prevents the intrastate movement of narcissus unless they have been certified as free of the eelworm and the bulb fly, or unless infested bulbs have been given the required hot water sterilization or fumigation treatment.

During August and September, 1931 a total of 74,000 narcissus bulbs was imported from Holland by six of our commercial growers. A total of 164,000 narcissus is being imported by 11 growers during 1932. All these bulbs received the hot water sterilization treatment as a condition of entry, at one of the three cooking plants owned by the growers in the Wilmington section, under the supervision of someone from this division, before they were released to the growers.

During 1932 the post flowering inspection of all narcissus plantings was made. These number 36 properties and include approximately 4,951,900 narcissus bulbs. North Carolina ranks well in the front in commercial bulb and flower growing.

Five plantings were found infested with eelworm and one was found infested with the narcissus fly. The eelworm infestation is considered light.

Bulbs which some of our growers desired to sell were inspected during the storage period. Approximately 765 bushels of bulbs were

given the sterilization treatment and 70 bushels were fumigated under our supervision as a requirement for movement to points within or without the State.

Other species of nematodes found in narcissus bulbs during the inspection are *Apelenchoides parietinus*, *A. subtenuis*, *A. fragariae*, *Apelenchus avenae*, *Cephalobus oxyroides*, *C. elongatus*, and *Diplogaster* species. Some of these are parasitic, and may cause some damage to narcissus plantings. None is near as injurious as the genuine eelworm, *Tylenchus dipsaci*.

It is a pleasure to note the spirit of coöperation among our bulb growers in our efforts to suppress the eelworm. We are hoping that this coöperation will lead to an early eradication of this pest from our commercial narcissus plantings.

#### PINK BOLLWORM SURVEY

In coöperation with the Bureau of Plant Quarantine of the Federal Department of Agriculture, workers of this division collected 27,000 cotton bolls during late September and early October of 1931 in 20 eastern counties. These were sent to the federal pink bollworm laboratory at San Antonio, Texas, and examined by workers there. No pink bollworm was found.

A similar collection is now being made for the season 1932 by assistants of the federal department.

This work is being done to locate any infestation of cotton by the pink bollworm, and with a view toward eradicating any initial infestation that may be found.

#### ARGENTINE ANT

Scouting work conducted by the Federal Bureau of Entomology during 1932 resulted in the finding of the Argentine ant at Charlotte, Goldsboro and Belmont. Wilmington and Raleigh were previously known to be infested by this pest. A total of 82 localities in 39 counties was scouted. This work was done exclusively by the U. S. Department of Agriculture. Mention of it is made here, since this species of ant is a well known pest, and since there is much likelihood of its spreading to other parts of the State. Efforts to eradicate it now from the few cities infested would be decidedly worth while.

#### JAPANESE BEETLE—A NEW PEST

A new and serious insect pest known as the Japanese beetle has finally established a foothold in North Carolina. The beetle stage feeds upon a



wide variety of shrubs, trees and flowers, while the larva or grub is a pest of nursery stock and lawns.

Scouting to determine the presence or absence of the beetle was done during the summer of 1931 by inspectors of the Federal Bureau of Plant Quarantine. No beetles were observed.

During June and July of 1932, traps designed to attract and capture the beetle were placed in five cities by the Plant Quarantine Bureau in coöperation with this division. Ten beetles were trapped at Winston-Salem, nine were trapped at Raleigh and one was caught at Durham. None was trapped at Fayetteville or Wilmington. From 200 to 400 traps were placed in each of the five cities.

The infestation as found is of course a very light one, but it is reasonable to suppose that much of the state will be infested by the end of another biennium.

It will probably soon be necessary for this state to actively enforce its quarantine on the products likely to transmit the beetle or its grub stages, which was made effective December 14, 1927. There is a possibility that our State may be included in the regulated area by the U. S. Department of Agriculture subsequent to its hearing on this subject on October 4, 1932.

#### CERTIFICATION OF QUEEN BREEDING APIARIES

The regular spring inspection of eight apiaries comprising 423 colonies, where queen bees are raised for sale upon a commercial basis was made during 1931. The late summer inspection was also made. No disease was found and the apiaries were accordingly certified.

A similar spring inspection was made of seven apiaries comprising 309 colonies in 1932. No American or European Foul brood was found in the apiaries.

#### BEE DISEASE ERADICATION

During the period May 19 to July 15, 1931, bee disease inspection and eradication work was conducted in Forsyth County, where there is considerable European and American foul brood present. Approximately 75 per cent of the county was inspected.

Of the 167 apiaries inspected and consisting of 1,191 colonies, 65 showed a partly diseased condition. A total of 152 colonies or about 12.7 per cent was found either partly or badly diseased. Of the 152 colonies found diseased, 107 were treated and 45 condemned and destroyed.

The 152 diseased colonies included 68 affected with American foul brood, 25 with European foul brood and 59 affected with sacbrood.

Plans were underway to repeat and continue this bee disease work in Forsyth County in 1932; but the curtailment of funds did not permit

the completion of this work. With another season's work, it would have been possible to clean up the diseased apiaries fairly well in this county.

A brief period of time was devoted to bee disease eradication in 1932 in Guilford County at the insistent demand of honey producers in that county. During a three day period of May, 18 apiaries were visited and 129 colonies inspected. Of the 41 colonies found diseased, 28 were treated, and 13 were condemned and destroyed. Of the 41 colonies, 32 were affected with American foul brood, five with European foul brood and four with sacbrood. Another visit should be made to these apiaries.

#### INSECT AND DISEASE CONTROL IN PEACH ORCHARDS

The time of one assistant for two months in each of the years 1931 and 1932 was devoted to the control of the curculio and diseases of peach trees in our commercial peach growing section. Aberdeen is maintained as headquarters for this work. Sufficient information is secured in our field laboratory there, so that the growers can be advised just when to apply spraying or dusting materials in order to control insects and diseases. It was planned to discontinue this work in 1931 because of a shortage of funds, but it was continued in 1932 in a limited way because of the insistent demands of the growers who require this scientific guidance in order to grow a crop of clean fruit.

#### INSECT COMPLAINTS OF THE BIENNIUM

A total of 223 different kinds of insects was inquired about or complained of during the past biennium by residents of the State. These included termites, weevils in stored grains, Mexican bean beetle, many kinds of plant lice, fleas in houses, ants on lawns and in houses, the 17-year Cicada, scale insects, red spider, roaches in houses, cotton boll weevil, pine beetles, bagworms and cutworms.

There was no serious outbreak of any insect. Boll weevil damage to cotton was small because of the hot and dry summers. The Mexican bean beetle continues to be a destructive pest, although gardeners are learning rapidly how to suppress its damage. Brood VI of the Periodical cicada made its appearance during June 1932, in Burke, Buncombe, Caldwell, Catawba, Henderson, Macon, McDowell and Rutherford counties. Damage by this insect to young apple trees was reported from two localities.

#### CORRESPONDENCE—RADIO TALKS

The division workers attended to the usual amount of correspondence, and the issuing of certificates, shipping tags and permits for the movement of nursery stock and the preparation of reports. During the past biennium, members of the entomology division have given 28 radio talks



and four public talks on plants, insects and animals. Several scientific and popular articles on these subjects were prepared for various publications including the Agricultural Review.

#### ACKNOWLEDGMENTS

In concluding this report, I wish to acknowledge your continued interest and support in our entomological work. It is a pleasure also to refer to the loyal and efficient service of each member of this division.

Respectfully submitted,

R. W. LEIBY,  
*State Entomologist.*

## DIVISION OF FOOD AND OIL INSPECTION

*To the Commissioner of Agriculture:*

SIR: I beg to submit the following report of the work and the accomplishments of the Division of Food and Oil Inspection for the past two years.

The object or purpose and the accomplishments of the work and the efforts carried out under this division are to protect the life, health and financial interests of the people of the State in the purchase of foods, beverages and various other products covered by the several inspection laws.

The work of the division is authorized by and carried out under the pure food, sanitary bakery, creamery, ice cream plant and cheese factory, bottling plant, bleached flour, standard weight meal and flour, linseed oil, illuminating oil and gasoline inspection laws.

The food law forbids the manufacture or sale of adulterated or misbranded foods or beverages. It makes it the duty of this Department to enforce the law without providing any funds for the purpose, but the laws supplementing the food law do carry inspection taxes and the enforcement of the food law depends upon the funds from the inspection taxes under these supplementary laws. The expenses of all of the inspection, chemical and all other necessary work, are borne by the use of funds from inspection taxes provided for by these inspection laws. These laws supplementing the food law prohibit the food producing places named therein from being operated under unclean and insanitary conditions so that the foods produced in these plants are clean and wholesome and are not deleterious to health.

### FUNDS COLLECTED BY THIS DIVISION

Funds legally intended for conducting the work for enforcing the laws under which the division operates are collected as inspection taxes by the division under the following inspection laws:

Bleached flour .....	\$27,435.00
Creamery, Ice Cream Plants and Cheese Factories.....	3,005.00
Bakeries .....	2,440.00
Bottling Plants .....	2,940.00
Linseed Oil .....	1,993.34
Also charge for examinations of human viscera for poison.....	300.00
<hr/>	
Total .....	\$33,113.34

(Oil and Gasoline Inspection Taxes are collected under the Commissioner's office.)



Careful sanitary inspections of the food producing plants are made by the food and sanitary inspectors. They secure samples of food and food products throughout the State for chemical and other examinations for adulteration. They also see that food products are properly labelled and branded.

Great improvements have been made in the sanitary and other conditions under which these plants are operated since the above sanitary inspection laws have been in effect. While many of these food producing plants are so operated and conducted that they fully meet the requirements of the sanitary laws, there are many of them that must have regular and frequent attention or the food products that they put out will be a public menace and deleterious to the health of the people of the State served by them. That class of food producing plants could be kept in better condition if the division had more funds for the expenses of the inspectors. The food inspection work is done as well as it can be with the limited funds for the purpose, and the inspection work for the detection of adulteration and misbranding and the sanitary inspection of food producing plants is done by the same men, which makes the cost of the work as little as possible. But if all of the funds collected by the division from the inspection taxes were available for use in the inspection work for which they are legally intended, the inspection work of the division could be much more efficiently done.

As the funds and force of the Division of Food and Oil Inspection are not sufficient to do all that should be done, and as the Federal food inspection work to a large extent covers food products in interstate shipments, this division has concentrated its efforts largely on food products originating in the State or on products shipped into the State in bulk, properly labelled what they are, and are then either repacked or retailed from bulk in the State, not then subject to the Federal law, and sold in the State for what they are not.

Samples of food products of various kinds have been obtained from all sections of the State and have been chemically, macroscopically or otherwise analyzed to determine if such products meet the requirements of the Pure Food Law and the regulations under the law. Careful attention has been given to such products as ice cream, bleached flour, honey, vinegar, carbonated bottled beverages, flavoring extracts, ground coffee and various other food products. Special surveillance has been maintained over such products as ground coffee and flavoring extracts that are shipped into the State in bulk, properly labelled what they are, but are either repacked under false or misleading labels or are retailed from bulk without the facts regarding their composition being made

known to the purchaser. Some adulteration and misbranding of this kind has been found and the facts have been reported to the courts.

In instances where the violations appeared not to have been intentional, the parties violating the law have been advised of the requirements of the law and the matter dropped, provided they agreed to use greater diligence in the future in meeting the requirements of the law.

#### LINSEED OIL

The object of the linseed oil inspection law is to require all linseed oil and substitutes for linseed oil offered for sale in the State to be labelled what they are so that a purchaser of either product may know what he is buying.

The samples of linseed oil analyzed during the past two years show practically no adulterated or misbranded linseed oil or substitutes for linseed oil are being offered for sale in the State.

#### ILLUMINATING OIL AND GASOLINE

A large number of samples of illuminating oil and gasoline have been analyzed, and not a great deal of trouble has been found with these products. However, there has been trouble, but it has been hard to place the responsibility in the cases found. Samples of gasoline have been analyzed that did not meet the State standard requirements and showed that they had had kerosene oil added to them. Parties from whom the samples were taken claimed that they sold what they bought. But no samples taken from the larger and more representative oil companies produced such results, and there is reason to believe that the adulteration was made by the retail dealers, though it has been suspected that there is a more or less unscrupulous class or lower order of wholesale oil and gasoline dealers who have been trying to smuggle illegal products into the State without paying the road and inspection taxes on gasoline. None of these cases, so far, have been reported to the courts for prosecution. But the inspectors, with the limited amount of funds available for expenses, have done the best they could to catch such shipments and to prevent such evasions of the law.

The oil and gasoline inspection taxes amount to more than \$700,000 annually and ten per cent of it would probably be ample for the enforcement of these laws but the amount allowed is not sufficient to properly enforce the laws.

The oil companies are continuing their research work in developing and improving chemical methods of converting the heavier oils of the crude petroleum into hydrocarbon compounds with lower boiling and



end points that can be used as good grade gasoline. Thus the volume of gasoline products have been greatly increased.

#### MISCELLANEOUS

The Department is frequently called upon to make chemical analyses which are not provided for by any of the inspection laws under which it operates, nor are they provided for by any other State law. Some of these analyses are difficult; some are long and tedious. This division does not attempt to do all of such work requested, but when it appears that an analysis would serve a worthwhile purpose and tend to prevent crime or be helpful to the citizens of the State, and there is no other provision for the examination being made, the work is usually done, determining the alcohol in beverages to aid in the enforcement of the prohibition law, examining various substances as foods, medicines, human and animal viscera and contents of stomachs for poisons, drugs for cocaine, opiates and narcotics to aid officials in enforcing the criminal laws to prevent crime. During the past biennium considerable unofficial work was done for orchards to determine whether the arsenic residue from spray on apples to be shipped in interstate commerce, some of which were to be exported, exceeded the tolerance permitted by the United States Department of Agriculture and also permitted by the foreign countries into which the apples were to be shipped.

Regular inspections, sanitary and otherwise, including collection of samples and investigating the various products used in such plants in the production of food products:

Bottling Plants inspected .....	180	Inspections made of same.....	1,081
Bakeries inspected .....	137	Inspections made of same.....	976
Creameries and Ice Cream Plants and Cheese Factories .....	118	Inspections made of same.....	810
Total plants inspected .....	435	Total inspections made .....	2,867

The number of samples examined chemically or otherwise are as follows:

Foods and beverages for adulteration.....	2,303
Foods and beverages for poison.....	70
Drugs, etc., for poison, dope and other objectionable substances.....	74
Apples for excess arsenic spray residue.....	51
Whiskey for medicinal purposes.....	10
Beverages, home brew, etc., for alcohol.....	47
Water for mineral and drinking purposes.....	54
Baking powders, soap, etc., for Division of Purchase and contracts.....	7
Human viscera or contents of same for poison.....	5
Animal viscera or contents of same for poison.....	21

Rat poison .....	3
Linseed Oil, official and unofficial.....	33
Illuminating oil, official and unofficial.....	6,932
Lubricating oil for motor use, unofficial.....	161
Gasoline, official and unofficial.....	16,866
Water and other substances for natural petroleum oil.....	14
Gasoline improvers or anti-knock substances.....	6
Anti-freeze mixtures for motor cars.....	5
Miscellaneous—Coke, coal, heating oils, cleaning mixtures and various other substances .....	77
<b>Total samples analyzed.....</b>	<b>26,739</b>

Respectfully submitted,

W. M. ALLEN,

*Chief, Food and Oil Division.*



## DIVISION OF MARKETS

*To the Commissioner of Agriculture:*

SIR: I herewith submit the Biennial Report of the Division of Markets.

The years 1931-1932 will be recorded in history as very disastrous one to the farmers in North Carolina. Prices received for all commodities were at a much lower level than those received in 1929-1930, and in most instances the net returns were not great enough to cover cost of production. It was realized that with our small personnel we could accomplish but very little working with individuals and we have, therefore, concentrated our efforts to a large degree in setting up county and state organizations.

### ORGANIZATIONS

There has been a concerted effort on our part to bring to the attention of the farmers in North Carolina the advantages and benefits of having a community or county exchange through which they can purchase fertilizer, seed and farm supplies at a vast saving and that this same machinery can be used for marketing miscellaneous commodities. This effort, carried on in coöperation with other agricultural agencies, has accomplished more in this field during the last two years than in any previous period of the same length of time, and I am pleased to advise that there has been a genuine interest manifested by the farmers of the State in this project of work.

New community and county exchanges formed are as follows:

Iredell County Mutual Exchange.....	Statesville
Chatham Mutual Milk Exchange.....	Pittsboro
Orange Mutual Exchange.....	Hillsboro
Alamance Mutual Exchange.....	Graham
Columbus Mutual Exchange.....	Tabor
Guilford Dairy Coöperative Association.....	Greensboro
Producers Mutual Exchange of North Carolina.....	Raleigh
Rowan Pure Seed Mutual Exchange.....	Salisbury
Onslow Farmers Mutual Exchange.....	Jacksonville
Watauga County Exchange.....	Boone
Chowan Mutual Peanut Exchange.....	Edenton
Pitt County Mutual Exchange.....	Greenville
Richmond County Mutual Exchange.....	Rockingham
Woodleaf Pure Seed Mutual Association.....	Woodleaf
Warren Mutual Exchange.....	Warrenton
Cleveland Farmers Mutual Exchange.....	Shelby
Aurelian Springs Mutual Exchange.....	Littleton

Mutual Poultry and Egg Exchange.....	Charlotte
Alexander Mutual Poultry Association.....	Taylorsville
Caldwell Farmers Mutual Exchange.....	Lenoir
Bethel Hill Mutual Exchange.....	Woodsdale
Lee Farmers Mutual Poultry Association.....	Sanford
Haywood Mutual Exchange.....	Waynesville
Edgecombe Mutual Livestock Association.....	Tarboro
West Wake Mutual Exchange.....	Apex
Lincoln County Mutual Exchange.....	Lincolnton
Henderson County Mutual Exchange.....	Hendersonville
Mitchell County Mutual Exchange.....	Bakersville
Avery County Mutual Exchange.....	Newland
Piedmont Mutual Exchange.....	Winston-Salem
Davidson Farmers Mutual Exchange.....	Lexington
Catawba County Mutual Exchange.....	Newton
McDowell County Mutual Exchange.....	Marion
Madison Farmers Mutual, Incorporated.....	Marshall
Rutherford County Mutual Exchange.....	Rutherfordton
Cherryville Mutual Exchange.....	Cherryville
Gaston Mutual Exchange.....	Gastonia
Albemarle Mutual Exchange.....	Roper
Roanoke Mutual Exchange.....	Jamesville
Scotland Coöperative Tomato, Incorporated.....	Johns

### *Producers Mutual Exchange of North Carolina*

One member of the Division directed the formation of a state-wide poultry and egg organization, the Producers Mutual Exchange of North Carolina. This organization is incorporated for \$200,000, divided equally into common and preferred stock. Its membership is composed of county and district mutual exchanges. I wish to advise that we held forty-six conferences in twenty-nine towns in connection with the formation and development of the Exchange. The organization is now functioning and has headquarters in Durham with a full-time manager.

Quite a bit of time was spent with the above-named organization in aiding them in their problems and assisting them in preparing their application to the Federal Farm Board, from whom they received a loan of \$20,000 for merchandising purposes. This loan was made at a very low rate of interest and will enable them to carry on their functions more efficiently and more economically.

### *North Carolina Fruit and Vegetable Mutual Exchange*

The formation of a state-wide marketing organization, the North Carolina Fruit and Vegetable Mutual Exchange, is the outgrowth of suggestions made by you during the past two or three years. In order to secure representatives on a fairly uniform basis, the State was divided



into nine districts with one director from each district. Only a few of the producing areas were represented at the preliminary meeting, which made it necessary to visit the sections not represented and secure a list of farmers who were interested and who would serve. With the aid of the Extension Service and the Department of Vocational Education and representatives of the Federal Farm Board, we were also able to have the National Fruit and Vegetable Exchange explained at the same time. Meetings were held at the following places: Rose Hill, Whiteville, Tabor, Laurinburg, Hamlet, Aberdeen, Candor, Vass, Elizabeth City, Hertford, Edenton, Columbia, Roper, Pantego, Aurora, New Bern, St. Paul, Lumberton, Fairmont, Bayboro, Clinton, Fayetteville, Bladenboro, Supply, Wilmington and Currituck.

One member of this Division, with all expenses paid, attended a general meeting of the National Fruit and Vegetable Exchange in Chicago, at which time definite plans were formulated for its operation in 1932. We were successful in having a district office located at Norfolk to serve the individual farmers and the marketing organizations of North Carolina. I wish to add that the tonnage obtained was nearly twice as great as anticipated and everybody concerned was well pleased with the service rendered and the prices obtained for the commodities marketed through this channel.

#### *Eastern States Division of the National Livestock Marketing Association*

We have been active and assisted in the formation of this Association. One member of this Division attended a meeting of representatives of livestock interests of the States of Tennessee, North Carolina, Virginia, West Virginia, Pennsylvania, Maryland, New Jersey, Delaware and New York at Washington, D. C., where a preliminary organization was formed and the constitution and by-laws were adopted and articles of incorporation drawn up. The object of the organization is to encourage the coöperative marketing of livestock in this territory, and to establish Producers Coöperative Commission firms on the Jersey City, Lancaster and Baltimore markets, and perhaps in time on the Richmond market. Through the National Feeder and Finance Corporation, a subsidiary of the National Livestock Marketing Association, we will be able to finance the feeding of livestock which should prove to be of great aid in the development of livestock industry in this State. All other livestock sections of the United States have been so organized and have found it of great help to the livestock producers in those sections. It has proved highly successful in all sections.

### *Peanut Organization*

We have done quite a bit of work in the formation of a State Exchange for this commodity. The work, as you will recall, was initiated by this Division two years ago and a small county exchange successfully marketed farmers stock peanuts. It was realized that any group of peanut growers would be seriously handicapped unless a sufficient volume was obtained whereby contracts could be made for cleaning and shelling, which would give a wider outlet and that is the basis upon which the State Exchange will operate, when a sufficient sign-up is obtained to justify economical operations.

### *Additional Services*

Additional services rendered to the various community, county and state organizations are that of giving assistance relating to coöperative marketing and that of auditing books of the various exchanges when requested to do so. I might add, in connection with this, that we have been instrumental in putting in a standard system of bookkeeping in all of the mutual exchanges. We also assist the various organizations from time to time in their transportation problems. Annual reports of the mutual exchanges and coöperative associations are received by this Division each year. We are attempting to make an individual study of each report and to help each organization to understand better the business principles involved.

## FRUITS AND VEGETABLES

### *Inspection Service*

<i>Commodity</i>	<i>Approximate No. of Packages</i>
White potatoes .....	1,720,000
Peaches .....	711,020
Strawberries .....	621,922
Snap beans .....	343,155
Sweet potatoes .....	105,000
Cucumbers .....	81,990
Tomatoes .....	21,000
Cantaloupes .....	8,500
Dewberries .....	6,007
Huckleberries .....	3,412
Apples .....	3,150
Fresh peas .....	208,714
Cabbage .....	800

The above represents inspections and certification as to grade and required a personnel of 97 temporary men in 1931 and 75 temporary men in 1932 during the heavy movement in June. Points at which we had



field offices are as follows: Elizabeth City, Mount Olive, Bayboro, Aurora, Columbia, Creswell, Fayetteville, Beaufort, Bethel, Pantego, Hasty, Washington, Fairmont, New Bern, Laurinburg, Smithfield, Wallace, Chadbourn, Tabor, Burgaw, Warsaw, Teachey, Faison, Vass, Roper, Jamesville, Rockingham, Plymouth, Southern Pines, Pinehurst, Aberdeen, West End, Jackson Springs, Sanford, Ellerbe, Marston, Morven, Candor and Hamlet.

This service is utilized advantageously in connection with the Perishable Commodities Act passed by Congress last year. This measure provides for the licensing of commission merchants, dealers and brokers in the terminal markets as well as shippers. Heretofore, certain receivers in the terminal markets would refuse to accept shipments which they had purchased if there had been a decline in the market of this commodity, but under the rules and regulations formulated by the Secretary of Agriculture, it is unlawful for any dealer, without reasonable cause, to reject or fail to deliver perishables on contract. The growers or shippers attach the certificate which we issue describing the quality and condition to the bill of lading in order to assure the receiver of the grade which he purchased. The Secretary has the authority to revoke the license if the purchaser fails to carry out his part of the contract and our shippers advise that the unjustifiable rejections are being eliminated.

In connection with the fruit and vegetable industry, permit me to state that members of the Division confer from time to time with growers and shippers relative to standardization and more orderly marketing.

#### *Market News Service*

In coöperation with the Bureau of Agricultural Economics we issued daily bulletins on white potatoes from Mount Olive and Elizabeth City in 1931, and from Washington in 1932; on strawberries from Chadbourn and on peaches from Candor in 1931-1932. These bulletins give the growers and shippers pertinent information such as f.o.b. prices at the larger shipping points, number of cars shipped each day and the number of cars each of the terminal markets receive, along with the price each market is paying. This information helps toward better distribution and marketing.

#### *Radio Broadcasting*

In coöperation with the Bureau of Agricultural Economics there is broadcast each day over Radio Station WPTF, Raleigh, N. C., the market information covering our major fruits and vegetables. In 1930 the information disseminated covered some three or four crops such as strawberries, white potatoes and peaches. In 1931 and 1932 these reports in-

cluded also snap beans, fresh peas, cucumbers, dewberries, sweet potatoes and other commodities.

### *Stabilization of the White Potato Industry*

In my biennial report of 1930 I discussed this project at length. I desire to say here that this work was continued during the past two seasons and that one member of this Division was very active in this project. This project, as you know, is carried on in coöperation with the Extension Services of the various States along the Atlantic Seaboard, and the U. S. Department of Agriculture. A series of meetings was held each year at Mount Olive, Calypso, Beaufort, Bayboro, Vanceboro, Aurora, Pantego, Bethel, Columbia, Elizabeth City and Currituck.

### FARM CROPS

Assistance was given in the standardization and marketing of any and all farm crops.

#### *Peanuts*

The inspectional work on this commodity was carried on at Williamston and Edenton in 1931 and proved of great value to the growers. We certified as to grade 32,929 bags, covered by 141 certificates.

#### *Soybeans*

Inspectional work on this commodity was continued during the past two years and temporary offices have been set up at Washington and Elizabeth City each year. We certified as to grade 257,886 bags, covered by 577 certificates. This work was started on a small scale and is proving very popular with the growers and shippers.

#### *Tobacco*

The grading work on this commodity was started on one market, namely, Smithfield, in 1929. During the past two years the work was extended, and in addition to Smithfield, we operated at Washington, Williamston, Wendell, Fuquay Springs, Farmville, Henderson and Oxford. In 1931 we graded 4,980,840 pounds, and in 1932 we graded 6,469,915 pounds.

#### *Tobacco Market News Service*

In coöperation with the Bureau of Agricultural Economics, we issued daily bulletins giving the prices paid to growers for the various grades of tobacco sold on the markets where we have the grading work. This report, in addition to the daily prices paid, also contained weekly and seasonal averages, along with the prices paid for the same grade of the previous season.



*Tobacco Radio Broadcasting*

Beginning in 1931 we made arrangements with Radio Station WPTF, Raleigh, N. C., to broadcast each afternoon information regarding the offerings of tobacco at points where we were conducting the grading work, along with average prices paid to the growers by grades and other information of interest to tobacco growers.

## LIVESTOCK

*Standardization*

One of the big problems in marketing livestock in North Carolina is the fact that there is a lack of uniformity of quality. During January and February of 1931 one member of the Division spent the greater part of his time in a campaign in four counties in Western North Carolina encouraging the use of better sires and management methods and pasture improvement.

One bull sale was held at Clyde where twenty purebred bulls from local breeders were sold.

Some work was done on docking and castrating lambs and preparation of wool for market.

We assisted in holding ram sales at Clyde and Sparta. Some excellent purebred rams were distributed among the growers at depression prices.

*Cattle Marketing*

We made an effort to secure a wider outlet for our butcher cattle by a tour with Swift and Company's buyer from Atlanta to leading cattlemen in the counties of Macon, Haywood, Madison, Yancey and Mitchell.

*Lamb Shipments*

The assistance of County Agents has been invaluable in the coöperative marketing of wool and lambs. Coöperative shipments of lambs were made from Watauga, Mitchell, Yancey, Jackson and Macon counties, and the growers benefited somewhat in five other counties where agitation was carried on for the coöperative shipment of lambs, although no lambs were shipped. We demonstrated very clearly that the man who produced good lambs profits considerably from coöperative marketing, and when we have our own commission firms on the markets he will profit even more.

*Wool*

Wool from the counties of Macon, Jackson, Haywood, Buncombe, Madison, Yancey and Mitchell, totaling 30,020 pounds was pooled with the United Wool Growers Association, and an advanced payment of fif-

teen cents per pound received when it was taken up. Wool from the counties of Alleghany, Watauga and Avery, totaling 73,000 pounds was pooled and sold direct to the Chatham Manufacturing Company of Elkin, N. C., for twenty cents cash. Farmers who did not pool benefited around three cents per pound on another 200,000 pounds. It is believed that it is conservative to state that the coöperative wool sales benefited the wool growers around \$15,000 in 1931.

In 1932, due to an exceedingly low market, the volume of wool handled showed quite a decline. Working with the exchanges and other agencies, we marketed 12,500 pounds through the United Wool Growers Association. Wool was secured from the counties of Mitchell, Yancey, Buncombe, Madison, Henderson, Haywood, Jackson, Franklin, Granville, Tyrrell and Currituck.

#### POULTRY AND EGGS

Due to low prices in northern and eastern markets and fairly good prices in the towns of this State for poultry, efforts along the lines of poultry marketing consisted chiefly in assisting organizations to develop their local markets. However, local markets have been unable to absorb the total volume in some localities. From such points truck shipments of poultry have been made to Norfolk, Richmond, Washington, Baltimore and Philadelphia, the latter point receiving less of our poultry than the other cities due to the greater distance. Although a number of the organizations in many instances barely broke even on their northern shipments, the local markets were bettered because of such shipments and total returns were larger thereby.

In the larger towns of the State poultry dressing plants are under consideration, one having been started in this period. It is possible two or three others will start operations in the near future. It has been found that the best combination of poultry marketing in this State consists of:

1. Carlot shipments of live poultry through the state-wide association (sponsored and developed by this Division) in coöperation with its local units: January 15-June 1 and November 1-December 31.

2. Supplementing the carlot shipments, associations located in the larger towns, operating poultry dressing plants and developing local markets for quality products.

3. Individual associations making truck shipments, during the period cars are not operating, to remove surpluses from dressing plants.

Eggs are the chief concern of, and are the largest source of income to the farm flock owner or commercial producer. The marketing of eggs



is a more complicated problem than that of poultry marketing. Much work has been done and more is under way immediately.

This Division is putting into effect a quality egg program for our State. It embraces the various factors of handling, caring for and treating eggs. Included is the feature of quality eggs in a standard pack uniform to the extent of being recognized throughout the State. Three of the better organizations have this work under way. It fits in with the program of quality dressed poultry for local consumption. The eggs of lower grades go into containers different from the quality egg and are sold to a different class of trade.

Grading and standardizing is the main hope for success in this work. There must be overcome, however, the unfair competition of our farmers having to sell their fresh eggs in competition with storage and other eggs shipped into this State from the midwest, which are sold here as fresh eggs. Regulations should require that such eggs be so labeled for the information of the consuming public.

#### CURB MARKETS

Assistance was given the various curb markets. The *Curb Market News* service was started in January, 1931 and was continued for a year. Blanks were sent to coöperative markets to be used in reporting the sale prices of various commodities. This information was compiled according to commodities and the market reporting.

#### CREDIT

Without a doubt credit is one of the biggest, if not the biggest problem facing North Carolina agriculture today. With commodity prices at what appears to be a ridiculously low level, it is essential that all products be produced as cheaply and as efficiently as possible. Very little, and in most instances not any of the prices obtained is left for the grower after paying for the materials used in production when bought on high credit. The difference between the cash price and the credit price very often represents the margin of profit and we have been and are still working on various plans whereby cheaper credit may be obtained.

Respectfully submitted,

R. B. ETHERIDGE,  
*Chief, Division of Markets*

## VETERINARY DIVISION

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*To the Commissioner of Agriculture:*

SIR: I herewith submit the Biennial report of the Veterinary Division.

### TICK ERADICATION

Dipping has been continued in the reinfested territory of Sampson, Duplin and Harnett counties, (referred to in previous reports) beginning March 10, 1931, and continuing every two weeks up to November 5, 1931, at which time it was believed that all cattle ticks had been eradicated and dipping was discontinued. Four vats in the three counties were used and about 60 herds of more than 500 cattle were dipped each month. A large number of inspections, about 3,000 per month were made in the three counties and also in adjoining and nearby counties for the presence of cattle ticks. All premises have been released from quarantine and I believe that the cattle fever tick has been completely eradicated from the State. We have received splendid coöperation from the U. S. Bureau of Animal Industry. They have been very liberal in supplying inspectors to carry on this work.

### BOVINE TUBERCULOSIS ERADICATION

Since the completion of the work of testing all cattle in all of the counties of the State in 1928, we have confined our efforts to the testing of state-owned herds, the herds of charitable institutions, herds to which imported cattle have been added, previously infected herds and certain herds in counties in which the three-year accreditation period has expired.

Numerous requests for testing are received, but on account of a lack of funds we are not able to take care of these requests, nor do I believe we should. This is purely personal service and being scattered as it is, it is much more expensive to us than for the owner to have his local veterinarian do the testing.

Very satisfactory coöperation with the U. S. Bureau of Animal Industry has been maintained. I wish again to mention the fact that North Carolina was the first state to complete the testing of all cattle in the State. This has since been done by seven other States—Muine, Michigan, Indiana, Ohio, Wisconsin, Idaho and North Dakota.

Johne's Disease, or paratuberculosis, has been found in five herds, which are now in quarantine. This is a chronic, wasting disease, the principal lesions being found in the intestines. The organism causing



this disease resembles somewhat the organism causing tuberculosis. A diagnostic test for detecting this disease has been perfected, but it is not so satisfactory as the tuberculin test for tuberculosis. By the continued use of this test and the practice of strict sanitation, the disease may be eliminated.

#### BOVINE INFECTIOUS ABORTION

Coöperation with the Experiment Station on the project for the control and eradication of this disease started in 1927, has been continued with good progress. About 25 herds are included in this project. The most of them are now free from the disease and we hope to have the others free in the near future. There has been an increasing demand for assistance in controlling this disease, which is now recognized as of great importance economically and is becoming important from the public health standpoint.

In May, 1929, a plan was worked out to give herd owners assistance with this disease by arranging to make tests without charge, the owner to have blood samples drawn by his veterinarian and sent to our laboratory. Many have taken advantage of this and we are working with an increasing number of herds. Suitable certificates are issued on herds found to be free from this disease on two annual tests. These are renewed annually. The following certificates are now in effect:

1. Coastal Plain Experiment Station, Willard.....	Jersey
2. Mountain Branch Experiment Station, Swannanoa.....	Jersey
3. Sedgefield Dairy, Greensboro.....	Guernsey
4. Herd dispersed .....	
5. Brown & Heilig, Salisbury.....	Guernsey
6. Klondike Farm (Thurmond Chatham), Elkin.....	Guernsey
7. S. Clay Williams, Advance.....	Red Poll
8. Dr. Clarence Poe, Raleigh.....	Jersey
9. L. G. Davis, Linwood.....	Guernsey
10. Central Experiment Station, Raleigh.....	Ayrshire
11. Quail Roost Farm (George Watts Hill), Rougemont.....	Guernsey
12. John C. Whitaker, Winston-Salem.....	Guernsey
13. O. L. Rhyne, Gastonia.....	Guernsey
14. Caledonia Prison Farm, Halifax.....	Jersey and Holstein
15. East Carolina Training School, Rocky Mount.....	Jersey and Holstein
16. Samarcand Manor, Samarcand.....	Ayrshire
17. W. Kerr Scott, Haw River.....	Jersey
18. N. C. School for the Deaf, Morganton.....	Holstein
19. N. C. State Hospital, Morganton.....	Holstein
20. N. C. School for the Blind, Raleigh.....	Holstein
21. State Prison Farm, Method.....	Guernsey and Jersey
22. Stonewall Jackson Training School, Concord.....	Holstein

23. A. & T. College, Greensboro.....	Jersey
24. T. Holt Haywood, Clemmons.....	Guernsey
25. W. C. T. College, Cullowhee.....	Guernsey
26. Cherokee Indian School, Cherokee.....	Holstein
27. W. A. Beeson & Sons, Walkertown.....	Guernsey
28. Osborne Farm, Canton.....	Guernsey
29. Mills Home, Thomasville.....	Holstein
30. Kennedy Memorial Home, Kinston.....	Jersey and Holstein

Many other herds are being regularly tested and the campaign to eradicate this disease in the state-owned herds has been continued. Thirteen of these are now accredited and we are working with the remaining ten.

A pamphlet entitled "Infectious Abortion of Cattle" was recently published and distributed to herd owners throughout the State. I consider this the most important livestock disease and believe that we should expand this work as rapidly as possible.

#### HOG CHOLERA AND SWINE PARASITES

No very serious outbreaks of cholera have been reported, though the disease has been prevalent in some sections. The promiscuous use of virus, the purchase of new animals and the feeding of infected garbage or table scraps continue to be the chief cause of the spread of this disease. The work of controlling cholera by quarantine, sanitation and the use of serum alone, and the control of internal parasites by sanitation started in January, 1929, in Beaufort and Hyde counties, has been extended to Washington and Tyrrell counties at the request of the County Commissioners and farmers of these counties.

Cholera has been very satisfactorily controlled in this area, the few outbreaks occurring being confined to the original premises. All reports of sick hogs are investigated and proper remedies for the correction of the trouble are recommended.

The inspector located in this area, when not engaged in investigating reports of disease in swine, visits farmers, for the purpose of putting into effect methods of preventing worm infestation. Good coöperation and results have been obtained from this. A detailed report of this work and a survey of the parasite situation was submitted in my report two years ago, to which I wish again to call attention. I feel that this is an important piece of work and essential for the future of the swine industry. I believe that it should be extended to include other counties and eventually to all counties in the East. I feel that the territory now being worked is sufficiently large for one inspector and that no attempt should be made to increase this, but that additional inspectors should be put on as soon as possible.



We have received splendid coöperation from the U. S. Bureau of Animal Industry on this work, and also from the county agents of Beaufort, Washington and Tyrrell counties.

### PULLORUM DISEASE CONTROL

Thirty-nine hatcheries in North Carolina had all the flocks from which they secured their hatching egg supply blood tested during the season 1931-32, for the purpose of removing the carriers of pullorum disease. The size of the hatcheries ranged from 1,000 to 52,000 egg capacity, totaling approximately 475,000 egg capacity exclusive of custom hatching facilities.

The stained antigen rapid, whole blood agglutination method of test was employed. The antigen was furnished by the Bureau of Animal Industry, U. S. Department of Agriculture without charge.

There was a total of 460 flocks consisting of 63,702 birds on which 105,289 tests were made. Eight major breeds and varieties were represented and are named in order of number of birds tested as follows: R. I. Reds; Barred Rocks; White Leghorns; White Rocks; White Wyandottes; Buff Orpingtons; Australorps and Jersey White Giants. The flocks were culled for egg production and breed markings, before the first blood test was applied and a total of 14,380 birds were removed as unfit for breeders. A part of the culling was done by the Poultry Extension Specialists of N. C. State College. Of the 105,289 tests made, 3,865 reacting birds or 3.67 per cent infection was discovered. These reacting birds were removed and marked for immediate slaughter.

#### *First Test*

There were 64,702 birds included in the first test. From this number 2,606 reactors or 4.03 per cent were removed. The majority of the flocks under test had been previously tested one or more years, there being 48,267 birds in the old flocks on first test. Of this number 1,388 birds or 2.87 per cent reacted. In the new flocks being tested for the first time there were 16,435 birds tested with 1,218 reactors or 8.77 per cent infection. Therefore, there was 5.90 per cent more infection in the new flocks on first test than in the old flocks.

#### *Second Test*

The second test involved 30,669 birds of which 1,064 or 3.47 per cent reacted. Of the total number of birds on the second test, 20,205 were in the old flocks. The reactors from these flocks number 571 or 2.83 per cent infection. The new flocks on second test consisted of 10,464 birds

of which 494 or 4.72 per cent reacted. There was 1.89 per cent more infection in the new flocks on second test than in the old flocks.

#### *Third Test*

The third test was applied to 9,450 birds and 188 reactors or 1.99 per cent of the birds were removed as reactors. Of this total number of birds 6,986 were in the old flocks and 127 of them or 1.82 per cent reacted. The new flocks and test consisted of 2,464 birds of which 61 birds or 2.48 per cent reacted. There was only .65 per cent more infection in the new flocks than in the old flocks on third test.

#### *Fourth Test*

The fourth test was applied to only 468 birds, all being in old flocks except 35 birds of which none reacted; of the 466 birds, 7 reactors, or 1.50 per cent infection was found.

#### *Summary*

It will be noted from the above figures that the new flocks run some higher in per cent infection than did the old flocks. This is due to the fact that the old flocks in most cases had been tested at short intervals for several years. The infection would have run higher in the new flocks most likely if the majority of the new flocks had not been established from blood tested stock.

The per cent infection in the different heavy breeds was found to be about equal, but the per cent infection in White Leghorns was considerably lower than in the heavy breeds.

A wide variation in the degree of infection was noted in different flocks, the chief reason apparently being the sanitary conditions. It was a case of reinfection as a result of insanitary conditions in many instances that made it difficult to rid flocks of the infection.

#### ANTHRAX

On August 1, 1931, a very virulent type of Anthrax appeared in the dairy herd of 100 animals belonging to Tom Pemberton, Greensboro, N. C. Anthrax is an acute, febrile, infectious disease of domestic animals, particularly of ruminants, horses and mules, caused by the bacillus anthracis. It affects man and all warm blooded animals and in the latter is usually fatal. The organism causing this disease is spore-forming and very resistant and may live on an infected premise for many years. This disease is very rare in this State, this being only the second outbreak in more than fifteen years, the other occurring near Asheville in 1927. Five of Mr. Pemberton's cows died before a definite diagnosis



was made, it being necessary to forward specimens to the laboratory of the U. S. Bureau of Animal Industry, Washington, D. C., for examination, there being no such laboratory maintained in this State. All cattle and mules on Mr. Pemberton's farm and on nearby farms were quarantined and promptly vaccinated and later revaccinated. On account of the extreme virulence of the infection, some animals died after they had been vaccinated, about seven or eight per cent in Mr. Pemberton's herd, this not being unusual in such cases. Mr. Pemberton lost a total of 16 animals from this disease. Dr. W. A. Hornaday, a practicing Veterinarian of Greensboro, contracted Anthrax from holding a post mortem on one of Mr. Pemberton's cows that died before diagnosis had been made. By prompt medical attention he made an uneventful recovery.

This disease first made its appearance in the herd at A. & T. College, although a positive laboratory diagnosis was not made. They lost three cows and nine or ten hogs during June and July and specimens were sent to the Bureau of Animal Industry, Washington, D. C., for examination, but on account of the extremely warm weather they decomposed enroute and a satisfactory examination was impossible. I assisted in a post mortem on one of these cows and from the lesions found and later developments I am sure that this was Anthrax. All cattle and mules on the A. & T. Farm were vaccinated and revaccinated and there were no further losses. In addition to the losses on Mr. Pemberton's Farm and the A. & T. Farm, three cows on three premises in this territory died from this disease. Mr. Pemberton operated a very large and successful retail dairy and with the occurrence of this serious disease in his herd there was quite naturally, considerable alarm and hysteria among some of the people in that section, which together with the unfortunate newspaper publicity caused a decrease in milk consumption, estimated by those in a position to know, at about 25 per cent. On September 10, after a very thorough study of the situation, I recommended to the City Council of Greensboro and the County Commissioners of Guilford, in joint session, that Mr. Pemberton's herd be appraised, slaughtered and burned and that the premises be thoroughly disinfected, the indemnity to be paid by the State, County and City. My reasons for this recommendation were as follows:

1. That such a procedure would destroy a serious center of infection and help prevent the further spread of the disease.
2. That such action would do much to restore confidence in milk and other dairy products and the dairy industry.

3. That it would to some extent help Mr. Pemberton to recover from a most serious loss which he had sustained, through no fault of his.

4. That it would obviate a law suit, for which there was said to be some grounds.

Representatives of the City of Greensboro and County of Guilford met with the Governor and Counsel of State on September 14, to discuss the plan recommended. The Attorney General ruled that State funds could not be used for this purpose and the matter was, therefore, dropped. The herd was again vaccinated and held in quarantine for 30 days following the death of the last animal. On October 24, the entire herd was shipped to Richmond, Va., and slaughtered under Federal supervision. Mr. Pemberton's Farm, as well as two other infected farms are on the watershed of South Buffalo Creek, one of the streams which forms Haw River. The City (Greensboro) sewerage disposal plant also empties into South Buffalo Creek and since this plant has received blood and wash water from a rendering plant that has used animals dead of Anthrax, it is reasonable to suppose that this plant contains the infection. In view of the above, I think we may reasonably expect further cases of Anthrax to develop along this stream, unless they can be prevented by vaccination. A sum of money has recently been made available for this purpose, and with these funds every effort will be made to prevent the occurrence of this disease next season. I wish to add that Mr. Pemberton has given us splendid coöperation at all times in helping to control this disease.

No cases of anthrax have occurred in the Greensboro section during 1932. We have vaccinated all exposed animals in this territory and they are being frequently inspected. An investigation is made of all animals that die in this district and we hope in this way to control this serious disease. We are receiving splendid coöperation from the Board of County Commissioners of Guilford County in this work.

On June 3, 1932, Lester Bros., who operate a retail dairy near Raeford, had a cow to die rather suddenly in their pasture. They brought some tissues and organs to this office and we promptly sent them to the laboratory of the U. S. Bureau of Animal Industry, Washington, D. C., for examination. A wired report the next day indicated that the animal died of anthrax. Further examination, including animal inoculation, confirmed this diagnosis. Anthrax serum was promptly secured and the entire herd and all other exposed animals, were vaccinated June 6. A total of four animals on this farm died before vaccination and none have died since. A careful investigation of this outbreak fails to indi-



cate how it was introduced into this herd. By vaccination and frequent inspections we hope to control this outbreak.

#### MISCELLANEOUS

We have had an increasing number of requests to investigate reports of outbreaks of disease. It has not been possible to take care of all of this on account of the greatly increased amount of laboratory and other work and a decrease in travel funds. Many of these requests for assistance are for a purely personal service that could be taken care of at less expense and entirely satisfactorily by the local practicing veterinarian. This presents one of the most unpleasant problems with which this Division has to deal. Many livestock owners apparently believe that the State should supply them free and prompt veterinary service for all conditions. This, of course, is impossible and I believe undesirable. We have followed the policy of investigating so far as time and funds will permit, those reports that indicate that a serious contagious disease exists that without our help, might spread and seriously affect the livestock industry, and when a large number of animals are affected and the cause cannot be determined.

#### SPECIAL SHEEP WORK

For some time we have been receiving reports that indicated that sheep scab might be present in Ashe, Alleghany and Watauga counties. Arrangements were made to place an inspector at West Jefferson on May 11, 1931 for the purpose of investigating these reports. The inspector remained in the territory until June 13. Inspections were made in all sections of three counties with a special effort made to examine sheep that were affected with skin trouble. A large number of sheep were inspected and scrapings taken for the purpose of making a microscopical examination for the scab mite. Prominent sheep men, farmers, merchants and other business men were interviewed for the purpose of gaining information in regard to this trouble. In a number of flocks a diseased condition of the skin was found, but in no case were we able to find the scab mite. It is, therefore, safe to assume that no true sheep scab exists in this section, and that this skin trouble is due to some cause other than the scab mite.

The writer visited this section during the time these inspections were being made and inspected a large number of sheep on a number of farms, but was unable to find sheep scab. The Department purchased a supply of lime-sulphur dip and shipped this into the territory. This was sold to the farmers at cost. From the investigations made, it would seem that there is an urgent demand for assistance to these farmers in

problems of feeding, breeding, the control of internal and external parasites and the general handling of their flocks. Many practices are now being followed which could be greatly improved upon.

No black-leg or glanders have been encountered during the period covered by this report, although we are constantly on the look-out for these diseases. We have continued to look after the health of livestock on the twenty-two State-owned farms and have made considerable effort, with success, to prevent disease among livestock. Investigation at the Caledonia Prison Farm March 17, 1931, of a fatal disease affecting horses and mules in one barn containing 120 animals showed that they were affected with botulism or forage poison. A number were sick and several had died. We recommended botulinus anti-toxin which we ordered and promptly administered and we have had no further report of trouble in this barn. On April 28, 1932 the same disease was diagnosed in another barn of approximately 120 horses and mules, a number being sick, several having died. All animals were promptly vaccinated and no further trouble has been reported.

Respectfully submitted,

WILLIAM MOORE,

*Chief, Veterinary Division.*



## DAIRY DIVISION

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*To the Commissioner of Agriculture:*

SIR: Following is the biennial report covering the activities of the Dairy Division of the North Carolina Department of Agriculture from and including 1931 and 1932:

### INSPECTION OF CREAMERIES AND BUTTER FAT TESTS

Thirty-six milk plants have been visited, thirty cream stations, a good many of which plants are a combination of milk plants, ice cream factories and butter making creameries. The milk that has been received at these plants has been weighed, sampled and tested. There being 5,575 tests made on the basis of butter fat valuation as determined by the Babcock Test. Six hundred and eighty-two tests have been made to check those made by the plant to determine errors and other mistakes or dishonesty that might be found. A system of record keeping has been installed at each receiving point, that each party's records may be kept accurately. The above tests have been reported to the producers. At each plant while milk or cream is being received the factors relating to butter fat tests have been explained to all parties delivering milk or cream. Milk plants, butter plants, ice cream factories and cheese plants, where milk and cream is bought on a butter fat basis have been visited and tests made of the product received. By special request of producers seventy-four meetings have been attended at which twenty-one hundred people were present. At these meetings a discussion of the difficulties of each individual producer was thoroughly gone over in addition to all questions that were asked were also thoroughly discussed. Upon request six hundred publications have been mailed out to vocational teachers and other teachers relating to dairying interests. There have been sixteen radio talks prepared and delivered by the Dairy Division through the broadcast arranged by the Department of Agriculture.

Through the coöperative activity with the Purchasing and Contract Department a list of all creameries and milk plants have been submitted to this Department and State Institutions. A most desirable spirit of coöperation has been obtained.

By discussing the problems relative to butter fat testing and production with the producers at their morning delivery of their milk at the several plants, a more complete and satisfactory understanding

is now prevailing than has at any time previous, and we feel that the support of the farmers producing milk is stronger than it has ever been before.

#### NORTH CAROLINA STATE FAIR

The Dairy Division participated in the Department Exhibit at the State Fair and considerable interest was shown therein.

#### OLEOMARGARINE ENFORCEMENT

In the Oleomargarine enforcement activities, the work has been carried on in a most competent manner by Mr. Charles Godwin, Jr., who assumes the entire duties. The travel required in this work has been as economically borne as possible, by the Chief of the Dairy Division and Mr. Godwin traveling together, thus eliminating 50 to 75 per cent of the cost of mileage.

License issued to retail dealers .....	1,714
Retailers not handling oleomargarine .....	3,132
Wholesale dealers not handling oleomargarine .....	228
Wholesale dealers handling oleomargarine .....	41
Cafes not using oleomargarine .....	1,874
Cafes using oleomargarine .....	139
Hotels not using oleomargarine .....	484
Hotels using oleomargarine .....	42
Boarding houses not using oleomargarine .....	966
Boarding houses using oleomargarine .....	259
Cafes discontinued use of oleomargarine .....	43
Hotels discontinued use of oleomargarine .....	19
Boarding houses discontinued use of oleomargarine .....	61
Wholesalers discontinued use of oleomargarine .....	17
Retailers discontinued use of oleomargarine .....	31
Inspections of small towns where oleomargarine is not used,	
55 towns inspections .....	275
Total inspections .....	9,325

Respectfully submitted,

A. H. KERR,  
Chief, Dairy Division.



## WAREHOUSE DIVISION

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*To the Commissioner of Agriculture:*

SIR: The following report covers the activities and operation of the State Warehouse System for the years 1931 and 1932.

The Warehouse System has had a steady growth from year to year, and the benefits of the Warehouse System have reached more people than ever before—not only the farmer, but every class associated with the handling of cotton.

The number of warehouses licensed during 1931 was sixty-four, which was an increase of twelve over the previous year. These warehouses had a storage capacity of 325,000 bales, and handled 350,000 bales, or an increase of over 50 per cent in the amount of cotton handled.

During 1932 the number of warehouses licensed increased to seventy-three, with the capacity increasing to 375,000 bales, and 290,000 bales were handled, or over 40 per cent of last year's crop.

The warehouses were inspected four times yearly by Federal inspectors, and only one serious infraction of the regulations occurred. The irregularities found at this warehouse were adjusted without any loss to the State.

The classing department of the System has been used more than any previous year. The licensed classer, who is connected with the System has classed over 40,000 bales for the depositors of the various warehouses during the past year, and has supervised the classing of 25,000 additional bales.

Loans for new warehouses or remodeling of old warehouses were made to the following:

Union County Warehouse .....	Monroe
Lincoln Bonded Warehouse .....	Lincolnton
Newton Bonded Warehouse .....	Newton
Rockingham Bonded Warehouse .....	Rockingham

The loans totaled \$32,000.

Previous to the past two years some of the warehouses have fallen behind in payment of interest and principal due the State on account of loans made but during the past two years the majority of these warehouses has paid all past due interest and some of the past due principal—a few of the warehouses paying all past due principal. During the past two years the following amounts have been collected:

Interest .....	\$48,003.56
Principal .....	26,570.00
Total .....	<u>\$74,573.56</u>

The warehouses located at Norlina and Benson, which were foreclosed by the State, have been leased and are returning a good rental to the State.

Below is a statement of the funds of the Warehouse System.

Actual or estimated as of June 30 each year	Cash on hand in Principal Fund	Amount of outstanding loans on warehouses on which State holds first mortgages	Invested in State Institutional and Government bonds	Cash on hand in Supervision or Operative Fund	Transfers from Supervision Fund to Principal Fund
1931.....	\$ 3,096.25	\$ 309,346.25	\$ 297,500.00	\$ 33,576.86	\$ 1,000.00
1932.....	7,570.00	298,372.50	327,000.00	24,344.12	20,000.00

Respectfully submitted,

A. B. FAIRLEY,  
State Warehouse Superintendent.



## THE STATE MUSEUM

*To the Commissioner of Agriculture:*

SIR: I am herewith submitting a brief summary of the operations of the Museum for the biennium ending June 30, 1932.

Under the financial conditions prevailing it has, of course, been necessary for us to curtail our activities and to refrain from branching out in any new lines of effort. But with a museum the size of ours there is always an abundance of work directly ahead in the caring for what we already have. Museum specimens in many lines are not permanent and a steady demand for replacement, repair and renovation always confronts us.

During the period under discussion the number of new specimens received has been, perhaps, slightly below normal. As the increase in our exhibits depends mainly on voluntary contributions, the present business conditions have had their effect, though I feel that we have been remarkably fortunate in keeping up the average as well as we have.

An albino deer, from Halifax County, donated in the flesh by Mr. F. Gus Neville, of Scotland Neck, through the courtesy of County Game Warden Lawrence, is one of our most valuable accessions. A harbor seal, taken near Ocracoke, is another rarity. Among other objects of interest are an old cotton gin from Granville County, albino specimens of gray and ground squirrels and quail, sections of a hickory tree eighty feet in height and nearly four feet in diameter, some bones of a fossil whale, from Wilson County, a pair of golden eagles, now very rare in North Carolina, and a great many other objects of interest too numerous to mention here.

Several new cases containing habitat groups have been prepared and placed on exhibition, the most noticeable of these being, one containing twenty specimens of water-birds rare in the State; one containing nine specimens of fox squirrel, showing the various different color-phases assumed by this animal, and a third containing a pair of quail with their nest and eggs among natural surroundings.

Last summer we secured photographs, measurements and notes of a large devil-fish (manta) caught near Fort Fisher. This great fish measured sixteen feet in width and ten feet in length and weighed approx-

imately three thousand pounds. This data can later be used in building up a life-size model of the original animal.

The attendance of visitors during the biennium was the largest we have ever had, totaling more than four hundred thousand for the two years. This indicates the hold the Museum has on the public.

In 1931, both Mr. Davis and I attended the annual meeting of the American Association of Museums, of which we are members, in Pittsburgh. In 1932, I attended the meeting in Cambridge, Mass., at my own expense. I consider a regular attendance at these meetings essential to us in keeping up with modern methods in our line of work.

The office work of the Museum has been carried on satisfactorily, and your allowing us the services of Miss Ballard for a part of her time has been of the greatest help to us in keeping up with our correspondence and in getting our filing and record work in better shape. Miss Ballard's services have also been valuable to us in preparing a scientifically arranged catalogue of the thousands of scientific pamphlets, bulletins and other publications which form a part of our small working library. There is a great deal more work ahead, however, before this catalogue will be completed.

Mr. Davis' time has been largely taken up in the determination of mineral specimens brought or sent in to the Museum from all parts of the State. A rock is a rock to many people, but a careful determination of its identity, a proper shaping up of its exterior, the painting of the proper identifying number on its undersurface and a book-entry of the number and of all details relating to the specimen are all necessary before the object takes its place in an exhibit case.

Mr. Davis has also taken a very active part in preparing for and installing the Department's exhibits at the State Fair for the past two years. Besides his special work in geology he undertakes a noticeable part of the general work of the Museum that would otherwise fall on the Director.

Besides the general work incident to his position, the Director has mounted a great many specimens of birds and mammals during the period and has prepared the habitat group cases that have been placed on exhibition and already referred to.

A lot of repair and renovation work on specimens has also been carried out and quite a number of finished specimens are now in the work-rooms awaiting some case-renovation work before taking their places in the exhibition halls.

Many of the cases in the exhibit rooms have been made dust-tight and insect-tight during the period, but there are a number of cases remain-



ing that still require this treatment. The worst enemies to the permanence of zoölogical specimens while on exhibition are dust, moths and dermestes, the last being a small but destructive species of beetle that is the bane of museum workers.

Both Mr. Davis and I have made a number of radio talks during the period, usually on some phase of natural history and conservation of wild life. I have also presented addresses before students of N. C. C. W. and of the East Carolina Teachers' College, and before civic and other public bodies.

We are doing all we can to keep down expenses and also keep the Museum on the high plane of usefulness it has hitherto enjoyed.

In conclusion, I desire to express to you my sincere appreciation of your continued active interest in the Museum and its work in every way.

Respectfully submitted,

H. H. BRIMLEY,

*Director, N. C. State Museum.*

## DIVISION OF WEIGHTS AND MEASURES

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*To the Commissioner of Agriculture:*

SIR: I submit herewith a report of activities of the Division of Weights and Measures for the past two years:

The 1931 session of the Legislature amended the Law as enacted in 1927 and amended in 1929, so that this work is supported by a straight out appropriation, thereby allowing inspections to be made as often as need be, in order to investigate and eliminate fraudulent practices. Under the former system one and only one inspection could be made, thus the unscrupulous person knew that as soon as inspection had been made and the inspector gone, he then had about twelve months to do as he pleased.

The difficulties confronting the enforcement of the provisions of the Weights and Measures Law from a financial standpoint are quite familiar to you; therefore, no need of enumeration, other than to say that for the past three quarters of a year this division has been allotted only 35 per cent of amount appropriated by the Legislature for same period, and I mention this in order to show what has been accomplished with \$4,993.71 for the fiscal year, July 1, 1931 to June 30, 1932, and \$700.00 for first quarter this fiscal year which is as follows:

Inspections .....	42,457
Condemnations .....	6,499
Confiscations .....	854
Releases .....	912
Prosecutions .....	31

In addition to the above there has been 2,748 different types, designs and combinations of weighing and measuring devices submitted by manufacturers in accordance with regulation No. 7, for approval for distribution in this State, out of which 1,896 have complied with the specifications and requirements and a certificate of approval issued.

There has been duly promulgated and approved by the Board of Agriculture the following regulations: Regulation No. 7, requiring all weighing and/or measuring devices be approved by this Division as to type and operation prior to distribution; Regulation No. 8 regulating the sale and distribution of ice; Regulation No. 9 regulating sale and distribution of coal, coke and charcoal; Regulation No. 10 regulating the placing of scales in plain view of customer; Regulation No. 11 standardizing fruit and vegetable barrels; Regulation No. 12 setting forth



variations, tolerances and exceptions as to small packages in accordance with Section 16 of the Law.

We have not been able to respond to all of the calls for investigation of irregularities or uncertainty of accuracy of weighing and measuring devices due to insufficient funds and personnel, however, we have looked into those appearing to be most flagrant with very satisfactory results.

Respectfully submitted,

C. D. BAUCOM,

*Superintendent, Weights and Measures.*

## SAVINGS AND LOAN ASSOCIATIONS

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*To the Commissioner of Agriculture:*

SIR: I am giving herewith a report on the Savings and Loan Associations for the biennium of 1931-1932.

During the past biennium, despite the unusual and deplorable financial conditions which have so beset our people, particularly farmers and wage earners, the savings and loan associations have steadily grown in number, membership and resources. This period of economic stress has been marked by failures of scores of banks in North Carolina, drying up all sources of credit for hundreds of communities. One result of this withdrawal of credit has been a rank growth of loan sharks which are fattening on the necessities of our people, charging from 20 to 25 per cent per month to their victims. There are now thirty-six such companies operating in as many cities in North Carolina owned and operated by an individual in a far-away northern city. There are doubtless other chains of which we are unaware, to say nothing of the hundreds of individuals and locally owned concerns taking their pound of flesh. Without any figures for a statement of fact, it is believed that the farmers, wage earners and salaried people of North Carolina are being bled to the tune of hundreds of thousands of dollars annually. Because of their great necessities for small loans, these victims are unable or unwilling to invoke the law for their own protection. The only cure for a condition which meets a human need, even illegally, is to replace it with a legal enterprise which will cure the disease.

The savings and loan association (credit union) is rated by the Russell Sage Foundation and other agencies in the country seeking to combat the usury evil, as being the most practical as well as idealistic solution of this problem. While the ordinary bank is set up and operated by people of means and on such a scale as to warrant the payment of supervision costs, the savings and loan association must be brought to the attention of the classes it would serve; has a limited field of operation; and, while the cost of operation is low, still the earnings are not sufficient for them to bear the cost of supervision. It is felt, however, by those who have studied this social problem that the State has a vital interest in building up the financial life of these groups by encouraging thrift among them and thus enabling them to take care of their small loan problem without their being utterly destroyed by prohibitive charges on loans. With property ownership, whether it be a home, farm, or savings ac-



count, there is created automatically a more stable society and better citizenship.

The savings and loan association enables a group of people (such as a group of farmers over a prescribed area, workers in mills, factories, or other enterprises) to pool a part of their savings in order that members of the association who need money for a production or remedial purpose may obtain same without paying tribute to loan sharks or other lending agencies whose sole purpose is exploitation of these working groups.

From the experiences we have had thus far, it is believed that the savings and loan association, grounded in coöperative effort, offers the best solution for the small loans problem. One of the district agents of the Agricultural Extension recently wrote his county agents as follows:

"Farmers must gain control of their own financing either on a cash basis or on a banking credit basis in order to reduce costs of production credit.

"This can be accomplished in a manner to make it possible for him to pay cash for his production materials. The Rural Savings and Loan Associations will serve well as the machinery through which this may be done. If Farmer's Savings and those of the 4H clubs and school children can be concentrated in one or more of these organizations, it will not be long before there will be enough money in them to finance the community. The savings made through cash buying will do it in three years."

The truth of the above statement has been proven already through a number of our rural savings and loan associations and it would appear that the Department can engage in no more profitable work than in giving such impetus as it can to the furtherance of this work.

It is believed that eventually there will be an end of the various forms of credit extended by the Federal Government. Their present method of distribution of such credit has proven a failure both as to methods of lending and collection, with no supervision of expenditures. It is the opinion of many of us, including county agents, who have studied this problem that the farmer is hurt rather than helped by this form of credit. The building up of farm credit in the rural communities through the encouragement of saving in the communities is undoubtedly the sane solution of this problem.

During this biennium there has been a greater call for new organizations than for any single year since my connection with the work. Twelve new organizations have been set up; two have gone into voluntary dissolution, in each instance without loss to members. One rural organization which started in March of this year, the Craven Savings and Loan Association, organized among the membership of the Craven

Mutual Exchange, is doing splendid work and gaining the confidence and support of the farmers of Craven County who patronize it. Many of the people of New Bern have caught the vision of its possibilities and are enthusiastic over what it can accomplish for the economic rehabilitation of that county.

We now have 61 active organizations in 35 counties with resources of approximately \$475,000 and membership of nearly 4,000 people. The supervision of these associations take a large part of the time of the Superintendent and the limited allotment of funds for travel makes the inauguration of new work difficult. It is believed that an extension of this work would go far toward placing our farmers and other workers on a sounder economic basis.

Respectfully submitted,

HARRIET M. BERRY,  
*Superintendent, Savings and Loan Associations.*



## DIVISION OF BOTANY

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*To the Commissioner of Agriculture:*

SIR: The Division of Botany of the Department of Agriculture is charged with the following lines of work:

1. The examination and testing, for purity and germination, of field, garden, flower, tree, and herb seed.
2. The identification, study, and control of noxious weeds.
3. The manufacture and distribution of pure nitro-cultures for the inoculation of the seeds of the different legume crops.
4. The placing of commercial grades on grains.
5. Recleaning and treating tobacco seed.

### NOTES ON THE STATE SEED LAW

The North Carolina State Seed Law was enacted for the purpose of promoting the use of better seeds among the farmers to the end that the farms of the State might produce greater yields of better crops at less cost, and for protecting agriculture against fraudulent practices on the part of the seed trade.

In its operation the law enables the dealer to secure good seed by having samples of a prospective purchase tested before the purchase is made; it protects the farmer against the purchase of poor seeds by enabling him to have his seeds tested in the State Seed Laboratories in order to check statements made by the dealer, and the public by protecting its food supply against being reduced by crop failure due to the use of poor seed.

Any citizen of the State can have his seed tested in the State Seed Laboratories free of charge, but a charge of twenty-five cents is made for each purity and each germination test when done for parties living outside the State.

The North Carolina State Seed Law does not in any way interfere with the freedom of contract as any farmer can purchase seeds of any degree of purity and viability he may choose, provided the dealer writes in the face of the State Seed Tag all the facts about which the farmer may care to know, such as the per cent of purity, viability, and the date tested. *The dealer must see that the farmer knows what he is purchasing at the time the purchase is made.*

The law provides that "Every package of seed weighing ten pounds or more, sold to a farmer for seeding purposes, shall have attached to it a State Seed Tag," showing all the facts above mentioned. Of course,

the Commissioner of Agriculture has the power to withdraw from sale any seeds he finds entirely unfit for planting, as well as all seeds when sold in violation of law.

All seeds sold in the State by seed dealers must be sold under authority of license in the name of either the retail dealer or the wholesale dealer. In case of a retail dealer selling seeds without license, he must sell *only those seeds* which he has purchased from a wholesale house that *has license to sell seeds in this State*. In case of a wholesale house selling seeds in North Carolina, it must sell under a license taken out in its own name or sell to only those retailers who do have a license to do a seed business in North Carolina.

Section No. 18 of the State Seed Law permits dealers to use the term "Standard Seed" only in case the face of the State Seed Tag shows a percentage of purity and germination equal to that required in said section.

The last Legislature made some revisions in the State Seed Law, the most important of which was the adding of "Wild Oats" to the list of noxious weeds in Section No. 6. It also provided that "Mixed Feed Oats," which is mostly wild oats, must not be sold in the State except in a finely-ground condition. This legislation was necessary to keep wild oats from becoming a common weed pest in the grain fields of North Carolina.

For the past several years the Department of Agriculture has been encouraging the production of pure-bred and higher-yielding strains and varieties of crop seeds in North Carolina in order that our farmers might the more successfully cope with the difficulties incident to buying seeds from other states, which seed might not be adapted to our soils and climate, or otherwise suited to the local agricultural needs of the State. The 1929 Legislature, through the influence and activities of the Commissioner of Agriculture and others, enacted Chapter 325, providing for the production and certification of crop seeds for North Carolina farmers. The Department of Agriculture is largely financing this movement for the production of better crop seeds and is coöperating with the College in carrying out the provisions of the law. The Commissioner of Agriculture is an ex officio member of the Board having executive supervision of and control over the production and distribution of pure crop seed in the State. The Pure Crop Seed Act was in force from and after its ratification.

The results following the enactment of the Certified Crop Seed Law show the time was fully ripe for such legislation. The following table presents, in concise form, the progressive results of the North Carolina



Crop Seed Association from its formation in 1929 to the beginning of 1932:

VOLUME OF SEED INSPECTED AND CERTIFIED BY THE NORTH CAROLINA CROP IMPROVEMENT ASSOCIATION COOPERATING WITH THE COLLEGE AND STATE DEPARTMENT OF AGRICULTURE  
1929-30-31

Seed Crops	Bushels Certified 1929	Bushels Certified 1930	Bushels Certified 1931
Corn.....	4,206	7,178	6,615
Wheat.....	1,500	7,771	10,300
Oats.....	2,010	8,075	49,060
Rye.....	200	1,395	3,675
Barley.....	1,560	1,150	5,205
Soybeans.....	303	679	22,420
Lespedeza.....	600	6,000	40,000
Cotton.....	19,097	29,156	41,065
Irish potatoes.....	1,400	830	1,540
Tobacco.....		625 Oz.	1,950 Oz.
Sweet potatoes.....	1,000	1,075	5,000
Grand Total.....	31,876 Bus.	63,309 *	184,880 Bus.

\* Tobacco seed not included.

Perhaps the volume of work done by the Seed Laboratory can be better comprehended when we know that samples of all the seed certified in the above tabular statement had to be examined and reported to the officials of the Association before certification could be made.

#### SEED LABORATORY

There have been received and tested in the seed laboratory the past two years a total number of seed samples amounting to over eight thousand.

#### *Tobacco Seed*

The months of December, January and February are largely given over to the recleaning of tobacco seed sent to us by the farmers. The past two years we recleaned over six hundred pounds for over 200 farmers.

#### *Seed Tags*

The past two years we distributed 238,294 seed tags.

#### *Nitro-Cultures*

The demand for pure cultures for legumes is still quite strong, showing that the State has much land not yet properly inoculated with nitro-cultures.

*Plant Identification*

We have had to give considerable time to plant identification. More and more attention is being given to the identification of drug plants and plants poisonous to livestock.

*Grain Grading*

Since our grain-grading service was established we have had 760 cases of disputed shipments of wheat, corn and oats submitted to us. Some of these cases involve large sums of money, and before this service was established the millers of the State sustained much loss in the acceptance of inferior grains from distant shippers. The Botanist of the Department is the Federal licensed grain inspector for North Carolina and South Carolina.

## SEEDS OF LOW VIABILITY

It must not be assumed that in every case a seedsman is selling seeds of low viability because our report shows his seed had a low percentage of germination, because many dealers send us their old left-over seeds in order to ascertain their value for the current year's trade. Of course, seeds of low vitality may be offered for sale, but the farmer should always demand the analysis, showing the quality of the seed, to be placed on the tag. Then the farmer should always send the State Seed Laboratory a small sample as a check on the seedsman's guarantee as shown on the seed tag. Farmers should demand the use of the State seed tag in all cases as this is their privilege and only guarantee of quality.

Respectfully submitted,

J. L. BURGESS,

*Chief, Division of Botany.*



## DIVISION OF PUBLICATIONS

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*To the Commissioner of Agriculture:*

SIR: In compliance with law and custom, I herewith have the honor to submit to you a summary of the work of the Division of Publications, to be incorporated in your forthcoming biennial report of the activities of the State Department of Agriculture.

The Division of Publications was established in its present form on August 15, 1925, and has continued to function without interruption since that time.

Acting upon your authority, the Division, during the biennium treated in this report, has arranged speakers for 104 weekly broadcasts, made from the studios of Radio Station WPTF at Raleigh. Every Division head has taken part in these programs, also the Commissioner and the Editor, who have taken their turns at the microphone. Besides these, the Division has arranged for special broadcasts, from time to time, when occasion demanded.

The Editor of Publications has personally prepared and edited copy for all issues of *Agricultural Review*, a semi-monthly publication issued by the Department. Besides reports which must be given to the public and other material deemed available for publication, the *Review* carries advertisements for farmers, which are printed without cost and which have resulted in great good to those taking advantage of them, according to letters on file in this office. The mailing list, since the paper was established in 1926, has grown from less than 5,000 to about 8,000, which means that it is read by at least 30,000. Copies of all issues have been preserved in the files of the Division of Publications.

During the biennium, thousands of pieces of literature have gone to the public schools of the State, dealing with the work of the Department and its relation to the public. Also thousands of letters from other inquirers have been answered with material requested, while the Division has seen to it that the newspapers of the State, through their representatives, were furnished with any and all material of public interest originating in the various Divisions of the Department of Agriculture. This material has consisted of numerous reports, released through the Editor of Publications, with summaries of addresses made by Department workers, as well as other material designed to aid our farmers.

Without extra compensation, the Editor of Publications has handled all publicity incident to the North Carolina State Fair, thereby saving the State hundreds of dollars heretofore spent to employ extra help.

The Division of Publications, working directly under the supervision of the Commissioner, maintains a status of coöperation with all the Department's Divisions at all times and is a clearing house for information coming from any and all of these. Also, the Editor engages in conferences with persons visiting the Department in search of information and endeavors at all times to give such inquirers every possible bit of assistance. The work of this Division is open to inspection at any and all times.

Respectfully submitted,

WM. H. RICHARDSON,  
*Editor of Publications.*



## STATISTICAL DIVISION

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*To the Commissioner of Agriculture:*

SIR: Herewith are presented the activity results of your Statistical Division for each of the past three years. The 202 reports developed, last year, for instance, represented an enormous number of individual judgments, covering many items of each report. These were developed into county, as well as State tabulations. Their regular scope was farm-wide, including acreages, conditions, yields, prices, quality, values and stocks of individual crops. Numbers and values of livestock, dairy, poultry and pig reports were included. Land values, farm wages, tobacco sales, mill and elevator reports, as well as other special reports such as pecans, tobacco, legumes, cotton, etc., were developed.

The two largest efforts are the tax list-takers' and Rural Carriers' surveys. The list-takers enumerate 33 items of farm information each April-May. The Carriers secure three surveys yearly on livestock and crop acreages. Thus, the \$2,250 clerical allotment for the Farm Census yields the information from more than 200,000 farms.

The *small* additional appropriation provides for crop meter measurements, cotton field examinations, and limited investigations over the State by the three Statisticians of this Division. It covers the Farm Forecaster publications, required forms, rentals and supplies.

### APPRECIATION

Hundreds of letters of appreciation have been received in relation to special information furnished, as well as for the Farm Forecasters, crop report releases and Farm Census records available only to Vocational Agricultural Teachers and to County Farm Agents. A survey of our crop reporters shows that + 99 per cent of them not only regard crop reports as advantageous, but many express appreciation of the reports they receive, as well as the privilege of serving the Department, without pay.

Especial credit is due to the County Commissioners and Tax Supervisors, to the Rural Mail Carriers, to thousands of individual voluntary crop reporters, ginners, millers, merchants and others contributing information requested. While the United States government contributed about an equal share in the expenses, yet more than 90 per cent of the real benefits are gained by the *counties and individuals of the State*. The Federal agencies are generous in letting the State have the credit and usage of any and all information collected coöperatively.

## PERSONNEL EXCELLENT

The Statistical Division is fortunate in its personnel. Most have been with it for more than ten years. They are highly efficient and steady workers. The system or office routine results in constant work for every one. Coördination of duties results in smooth operation, in spite of frequent shifts in tasks.

## FARM CENSUS

The attached statistical summary shows that a decline has been made in the numbers of farms reported on for the past two years. There was a steady growth from 1918 to 1930. This is partially due to lessened contacts—reduced funds. These surveys are destined to make a name (through information provided) for the Department that may stand out above any other work of this Division. It should be cultivated.

In March, 1932, the Statistician held special conferences with interested parties at about sixty county seats. He averaged more than three each day. These were for the purpose of clarifying the Farm Census usages and enumeration. That this was a wise investment is proven by the 1932 Farm Census results in those counties. This should be repeated next March for the interest of county individuals as well as for the results sought.

The average person doesn't understand, much less appreciate, statistical information. For instance, when we say the corn acreage is 103 per cent of last year's crop, it sounds quite simple and open to probable error. However, few understand that practically all the farmers of each county contributed their judgment. Several comparative angles are sought, mathematical problems and graphic charts are employed. Thus, days and weeks of effort may be given to a single crop's acreage determination. This is just as a competent physician would go into endless detail in diagnosing and testing in order to determine the probable true condition of a patient. The Agricultural Statistician must be familiar with the influencing factors and peculiarities of each of the State's fifty crops. He must know rain and soil influences, market and supply factors, as well as farm psychology.

Office management—labor distribution has been developed to a high degree, as evidenced by the same force now doing fully twice the work they did (efficiently) a few years ago. The principal basis of this is the establishing of definite dates for the starting and completing of reports. *"The report must be completed on time."*



## FIELD INVESTIGATION

Just as any farmer will be discredited who attempted to operate his farm by not visiting his fields and having a hand in his practical affairs, so will the crop report work suffer if we fail to maintain contact by field investigations over the State. This is especially true during the crop growing months from April to November—planting through harvest seasons.

Important features of this are the cotton boll counts and crop meter measurements. Boll counts are made at five mile intervals *during* July, August and September travel. The crop meter work includes measuring of all fields on both sides of the highway over established routes in May and August-September. Thus, three to five objectives are covered in a single trip. *Always* our travel is so planned as to include *many* investigations and points of contact, and not just a few on a given trip. Economy is thereby insured.

## ECONOMIC MEMBERSHIP

Our membership in American Statistical Association has saved more than its cost through savings in purchases of economic and statistical publications. It also keeps us informed and in good standing. The Journals alone are worth the dues. The following Economic Report Services are received *Free*: "Babson," "Brookmire," "United" and "Garside." The regular rates for these total more than \$350.

## PERFORMANCE OF DIVISION 1930-1932

The general results of this Division have shown increased efforts since 1929 excepting for travel, the Farm Forecasters, and completeness of the Farm Census. These and the crop report releases have been greatly reduced for lack of funds. Yet these are the *real purposes* or *finished products* of this office.

There is a mass of unused though valuable farm economic information available for publication. Really, the farmers and public are due it since their time and money go into their collection. The Publicity Division might find a gold-mine of current facts here to the distinct profit of the Department.

The fiscal year 1931-32 resulted in the following *report summarizations* and analyses by the Crop Reporting Service. The figures represent different—separate reports:

All crops (monthly).....	12	Small grains .....	3
Regular cotton .....	8	Rural Carrier surveys.....	3
Special cotton .....	5	Crop yields .....	2
Ginners .....	4	Pecans .....	3
Tobacco sales .....	8	Sorghum syrup .....	2
Special tobacco .....	4	Cost of producing crops.....	1
Dairy .....	12	Poultry and livestock.....	6
Fruit and truck .....	7	Other specials .....	9
Mills and elevators.....	4	Farm Census <i>State</i> reports.....	3
Peanuts, soy beans and cowpeas	6	Farm Census <i>County</i> reports.....	99

These represent an average of four per week.

	1929-30	1930-31	1931-32
Reports developed .....	189	196	202
Counties investigated (travel).....	93	92	96
<i>Letters</i> received .....	5,961	7,243	7,346
<i>Reports</i> received (schedules).....	30,100	33,855	37,357
<i>Letters</i> mailed .....	4,847	4,368	7,463
<i>Reports</i> mailed .....	109,186	94,400	95,100
Schedules mailed (for reports).....	133,687	124,484	166,474
Rural Carrier Cards mailed (for reports).....	40,500	58,500	61,500
Rural Carrier reports (received).....	9,380	9,095	9,877
Farm Forecasters mailed—publication copies....	30,350	33,700	12,100*
Crop meter measurements and studies (miles)..	5,670	3,717	4,516
Counties included in crop meter trips.....	82	82	85
Additional field investigations (miles).....	16,148	13,985	12,826*
Farm Census Survey (farms).....	200,239	217,337	197,482*
Cotton boll counts (fields).....	1,055	999	871*
Cotton fields examined by Statists (5 miles intervals) .....	520	466	429*
Envelopes furnished (U. S. Department).....	398,000	417,000	420,000
Reams stationery furnished (U. S. Department)	383	525	795
Value of U. S. stationery furnished (dollars)....\$	541	\$ 548	\$ 766
Postage value (dollars saved franking privilege)\$	7,800	\$ 8,000	\$ 8,050
Expenses (Emergency Farm Census clerks).....\$	4,533	\$ 3,606	\$ 2,494*
Expenses (all other).....	\$ 4,315	\$ 3,904	\$ 1,605*
Salaries (7 personnel).....	\$12,900	\$13,200	\$10,440*

\*Show heavy declines.

Most of the equipment and office supplies have been furnished by the United States Department of Agriculture.

Respectfully submitted,

FRANK PARKER,  
Statistician.



# DEPARTMENT OF AGRICULTURE

## STATEMENT OF RECEIPTS

FISCAL YEAR ENDED JUNE 30, 1931

Fertilizer .....	\$202,515.58
Cotton Seed Meal.....	20,925.76
Feed .....	50,785.55
Seed Licenses .....	3,125.00
Condimental Feed Licenses.....	620.00
Serum .....	16,151.79
Costs .....	1,696.46
Legumes .....	169.32
Linseed Oil .....	940.72
Bleached Flour .....	13,290.00
Bottling Plants .....	1,540.00
Ice Cream Plants.....	1,485.00
Insecticides .....	2,144.48
Analyzing Stomachs .....	300.00
Test Farms .....	41,267.42
Bakeries .....	1,270.00
Chicken Tests .....	3,978.75
Markets .....	4,739.95
Seed Tags .....	1,556.04
Seed Tests .....	.50
Entomology Permit Tags.....	2,302.90
Tobacco Work .....	4,383.37
Refunds .....	144.85
Oleomargarine Licenses .....	116.70
	<hr/>
	\$375,450.14
Balance first of fiscal year.....	153,640.45
	<hr/>

\$529,090.59

### Gasoline Inspection

Gasoline Tax Stamps.....\$657,334.12

657,334.12

### Oil Inspection

Oil Tax Stamps.....\$ 84,899.17

84,899.17

## STATEMENT OF DISBURSEMENTS

JULY 1, 1931—JUNE 30, 1932

*Administration:*

Board .....	\$ 921.20
Salary Commissioner .....	2,250.00
Salary Staff .....	9,346.28
Supplies .....	810.32
Tags .....	3,762.70
Postage .....	465.00
Telephone, etc. ....	237.62
Express, etc. ....	133.77
Travel .....	801.24
Printing .....	2,450.09
Repairs .....	85.74
General .....	320.59
	<hr/>
	\$ 21,584.55

*Inspection:*

Salaries .....	\$ 6,591.00
Supplies .....	87.01
Express .....	265.65
Travel .....	12,219.07
Printing .....	35.02
	<hr/>
	19,197.75

*Markets:*

Salary Chief .....	\$ 3,050.00
Salary Staff .....	9,863.00
Salary Extra .....	500.00
Supplies .....	207.41
Postage .....	195.00
Telephone, etc. ....	288.07
Express .....	6.93
Travel .....	3,488.03
Printing .....	4.50
Repairs .....	50.00
Fees .....	1,032.14
Subscriptions .....	97.00
	<hr/>
	18,782.08

*Savings and Loan:*

Salary .....	\$ 2,475.00
Travel .....	938.07
	<hr/>
	3,413.07



*Analytical:*

Salary Chief .....	\$ 3,074.00
Salary Chemists .....	11,862.00
Salary Clerks .....	3,526.00
Other Salaries .....	2,372.52
Office Supplies .....	109.51
Laboratory Supplies .....	108.10
Postage .....	200.00
Telephone, etc. ....	56.50
Express .....	64.34
Printing .....	192.51
Repairs .....	25.20
Equipment .....	807.44

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\$ 22,398.12

*Entomology:*

Salary Chief .....	\$ 3,050.00
Salary Staff .....	6,776.00
Office Supplies .....	64.85
Postage .....	200.00
Telephone, etc. ....	87.94
Travel .....	3,489.19
Printing .....	408.87
Subscriptions .....	43.00

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14,119.85

*Botany:*

Salary Chief .....	\$ 3,050.00
Salary Staff .....	7,198.00
Office Supplies .....	110.45
Laboratory Supplies .....	93.18
Postage .....	110.00
Telephone, etc. ....	69.72
Express .....	18.66
Travel .....	19.85
Printing .....	194.37
Repairs .....	1.50
Office Equipment .....	12.00
Laboratory Equipment .....	650.00

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11,527.73

*Pure Food:*

Salaries .....	\$ 5,679.00
Office Supplies .....	131.08
Laboratory Supplies .....	184.33
Printing .....	91.94
Repairs .....	9.00

Laundry .....	\$ 8.38
Laboratory Equipment .....	73.25
Travel .....	70.19
Postage .....	120.00
Telephone, etc. ....	70.35
Express .....	1.66

\$ 6,439.18

*Crop Statistics:*

Salary Chief .....	\$ 2,162.00
Salary Staff .....	8,171.30
Salary Census .....	2,565.74
Supplies .....	84.06
Postage .....	48.60
Telephone, etc. ....	104.16
Travel .....	407.60
Printing .....	556.95
Repairs .....	19.85
Subscriptions .....	10.00
Equipment .....	48.87

14,179.13

*Museum:*

Salary Chief .....	\$ 3,050.00
Salary Staff .....	2,941.32
Supplies .....	143.72
Postage .....	20.00
Telephone, etc. ....	61.10
Express .....	7.36
Travel .....	89.09
Subscriptions .....	31.75
Equipment .....	29.00

6,373.34

*Serum:*

Supplies .....	\$ 62.00
Postage, etc. ....	775.93
General .....	18.82
Serum to be resold.....	15,782.98

16,639.73

*Drainage:*

Salary .....	\$ 1,583.30
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1,583.30



*Veterinary:*

Salary Chief .....	\$ 3,050.00
Salary Staff .....	10,540.71
Supplies .....	96.11
Telephone, etc. ....	87.31
Express .....	34.54
Travel .....	5,106.25
Repairs .....	10.00
Tick Eradication .....	747.00

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 \$ 19,671.92
*Test Farms:*

Salary Chief .....	\$ 3,050.00
Salary Staff .....	48,198.68
Office Supplies .....	95.94
Agricultural Supplies .....	29,240.61
Postage .....	80.00
Telephone, etc. ....	87.15
Express .....	18.43
Travel .....	2,902.93
Printing .....	71.02
Insurance .....	466.77
Equipment .....	1,322.50

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 85,534.02
*Miscellaneous:*

Custodial .....	\$ 7,200.00
Farmers Convention .....	300.00
State Fair .....	351.82

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 7,851.82
*Dairy:*

Salary .....	\$ 3,050.00
Travel .....	1,782.29

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 4,832.29

*Tobacco Work:* .....\$ 3,117.41

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 3,117.41
*Coastal Plain Farm:*

New Barn .....	\$ 1,216.62
Repairs .....	449.27

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 1,665.89

Weights and Measures.....\$ 50.00

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 50.00

Total .....

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 \$278,961.18

State College .....	\$ 41,600.00
Seed Improvement Work.....	5,000.00

*Gasoline and Oil Division:*

Salary Commissioner .....	\$ 2,250.00
Salary Staff .....	19,529.32
Salary Inspectors .....	13,200.00
Office Supplies .....	38.35
Postage .....	193.00
Telephone, etc. ....	39.90
Express .....	1,476.73
Travel .....	18,234.77
Printing .....	416.34
General .....	16.38

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\$55,394.79

*Weights and Measures:*

Salary Superintendent .....	\$ 1,800.00
Salary Inspectors .....	1,205.83
Supplies .....	107.85
Postage .....	50.00
Telephone, etc. ....	3.08
Travel .....	1,771.45
Printing .....	55.50

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4,993.71



## DEPARTMENT OF AGRICULTURE

### STATEMENT OF RECEIPTS

JULY 1, 1931—JUNE 30, 1932

Fertilizer .....	\$135,131.84
Cotton Seed Meal.....	24,261.34
Feed .....	36,641.08
Seed Licenses .....	2,300.00
Condimental Feed Licenses.....	540.00
Serum .....	18,273.46
Costs .....	633.99
Legume Inoculation .....	97.44
Bleached Flour Licenses.....	14,145.00
Bottling Plant Licenses.....	1,400.00
Ice Cream Plant Licenses.....	1,520.00
Insecticides .....	577.48
Test Farm Receipts.....	25,603.67
Bakery Licenses .....	1,170.00
Chicken Tests .....	2,902.63
Markets .....	222.50
Seed Tags .....	819.90
Seed Tests .....	9.50
Entomology Permit Tags.....	2,173.26
Tobacco Fees .....	1,211.39
Refunds .....	404.78
Oleomargarine Licenses .....	1,958.36
Tree .....	5.00
Old Account .....	333.28
Weights and Measures.....	50.00
Linseed Oil .....	1,052.62
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	\$273,438.52
Gasoline Stamps .....	647,302.28
Oil Stamps .....	86,094.49
Weights and Measures.....	550.00

## STATEMENT OF DISBURSEMENTS

FISCAL YEAR ENDED JUNE 30, 1931

*Administration:*

Board of Agriculture.....	\$ 1,410.98
Commissioner .....	2,250.00
Salaries and Wages.....	10,790.00
Supplies and Materials.....	5,585.57
Postage, Telephone, etc.....	1,120.52
Travel .....	942.98
Printing .....	3,707.19
Repairs .....	3.50
General .....	1,616.78
Equipment .....	74.13
	<hr/>
	\$ 27,501.65

*Inspection:*

Salaries and Wages.....	\$ 9,010.00
Supplies and Materials.....	20.56
Postage, Telephone, etc.....	342.86
Travel .....	16,218.56
	<hr/>
	25,591.98

*Markets:*

Salaries and Wages.....	\$ 16,483.66
Supplies and Materials.....	398.94
Postage, Telephone, etc.....	976.90
Travel .....	6,415.07
Printing .....	80.53
Repairs .....	10.20
General .....	984.19
Equipment .....	75.58
Salaries Inspectors Fruits, etc.....	1,000.00
Travel Inspectors Fruits, etc.....	247.80
	<hr/>
	26,672.87

*Savings and Loan:*

Salaries .....	\$ 3,000.00
Travel .....	1,076.40
	<hr/>
	4,076.40



*Analytical:*

Salaries and Wages.....	\$ 24,072.00
Supplies and Materials.....	1,382.79
Postage, Telephone, etc.....	495.79
Travel .....	118.73
Printing .....	399.14
Repairs .....	92.01
Equipment .....	1,484.35
	<hr/>
	\$ 28,044.81

*Entomology:*

Salaries and Wages.....	\$ 11,260.00
Supplies and Materials.....	355.76
Postage, Telephone, etc.....	295.12
Travel .....	5,185.93
Printing .....	539.48
General .....	168.70
Equipment .....	23.95
	<hr/>
	17,828.94

*Botany:*

Salaries and Wages.....	\$ 11,780.00
Supplies and Materials.....	498.52
Postage, Telephone, etc.....	139.96
Travel .....	153.54
Printing .....	30.00
Repairs .....	20.00
General .....	14.00
Equipment .....	590.50
	<hr/>
	13,226.52

*Pure Food:*

Salaries and Wages.....	\$ 6,250.00
Supplies and Materials.....	418.45
Postage, Telephone, etc.....	154.27
Travel .....	151.07
Printing .....	19.80
Repairs .....	19.83
General .....	33.00
Equipment .....	466.26
	<hr/>
	7,512.68

*Crop Statistics:*

Salaries and Wages.....	\$ 16,800.83
Supplies and Materials.....	180.87
Postage, Telephone, etc.....	99.13
Travel .....	1,017.80
Printing .....	3,081.24
Repairs .....	7.70
General .....	19.39
Equipment .....	131.58
	<hr/>
	\$ 21,388.54

*Museum:*

Salaries and Wages.....	\$ 6,940.00
Supplies and Materials.....	1,224.26
Postage, Telephone, etc.....	107.77
Travel .....	261.76
General .....	11.80
Equipment .....	344.82
	<hr/>
	8,890.41

*Serum:*

Supplies and Materials.....	\$ 799.52
Postage, Telephone, etc.....	1,067.32
General .....	67.55
Serum to be resold.....	12,716.50
	<hr/>
	14,650.89

*Drainage:*

Salaries and Wages.....	\$ 1,899.96
	<hr/>
	1,899.96

*Veterinary:*

Salaries and Wages.....	\$ 17,220.50
Supplies and Materials.....	547.05
Postage, Telephone, etc.....	163.11
Travel .....	8,589.74
Printing .....	28.50
Repairs .....	1.25
General .....	50.00
Equipment .....	87.53
Workmans Compensation .....	442.00
	<hr/>
	27,129.68



*Test Farms:*

Salaries and Wages.....	\$ 59,138.60
Supplies and Materials.....	40,210.51
Postage, Telephone, etc.....	195.52
Travel .....	4,710.62
Printing .....	35.48
Insurance .....	714.05
Equipment .....	3,979.75

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\$108,984.53

*Miscellaneous:*

State College .....	\$ 60,000.00
Custodial .....	7,200.00
Farmers Convention .....	500.00
State Fair .....	492.56
Seed Improvement .....	5,000.00

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73,192.56

*Emergency:*

Atlantic Coast Line Special.....	\$ 425.00
Auditorium Mountain Test Farm.....	1,600.00
Chairs Auditorium .....	350.00
Tobacco Work .....	7,383.37
State Fair, additional.....	3,500.00
Dairy Work .....	6,112.39

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19,370.76

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\$425,913.18

## GASOLINE AND OIL DIVISION

Salaries and Wages.....	\$ 39,940.00
Supplies and Materials.....	119.12
Postage, Telephone, etc.....	1,850.49
Travel .....	23,177.08
Printing .....	313.76
General .....	229.06

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65,629.51

## WEIGHTS AND MEASURES DIVISION

Salaries and Wages.....	\$ 2,355.00
Postage .....	15.00
Travel .....	1,108.05

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3,478.05





